Paper TRADE JOURNAL

Feb. 1, 1952

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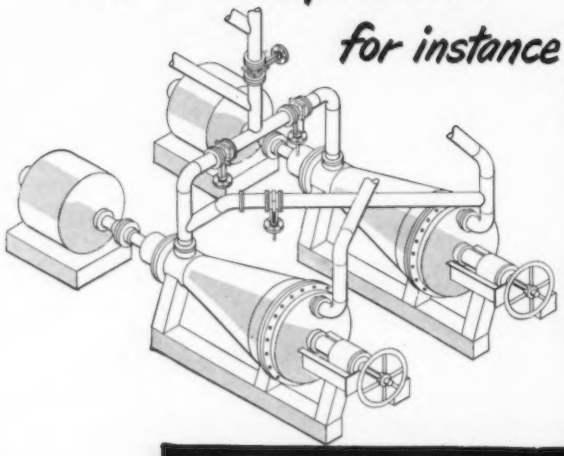

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On pulp stock lines in Jordan room at Chase Bag Company mill, Chagrin Falls, Ohio.

THE HISTORY

Valves formerly used caused excessively frequent shutdowns for cleanout of clogged lines. Pulp trapped in seats and bonnets; valves inoperative. *Working conditions:* Consistency of stock normally about 4%. Pipe and valve size, 8 in. throughout system. Operation continuous; valves operated infrequently.

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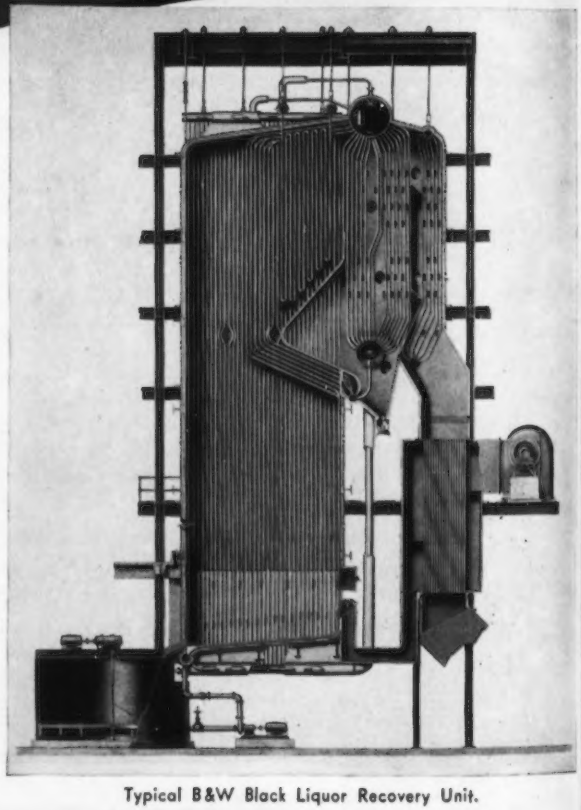

Typical B&W Black Liquor Recovery Unit.

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ARTHUR E. GORDON, Vice-President
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NEXT WEEK

An interesting and comprehensive survey of the design and operation of various types of cylinder moulds used for making tissue will be found in "Cylinder Machines, Some Problems of Design and Operations," by H. D. Cook of Sweet Bros. Co., Phoenix, N. Y.

REMEMBER THESE DATES

FEB. 19-22: American Pulp & Paper Assn., Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y. Starts on Tuesday this year. 75th Annual Dinner Thursday, Feb. 21.

FEB. 19: Maine Alumni Luncheon, 12:30, Biltmore Hotel, New York, N. Y.

FEB. 20: M.I.T. Paper Industry Alumni luncheon, Engineers Club, New York, N. Y.

FEB. 20: Salesmen's Assn. of the Paper Industry, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, N. Y.

FEB. 18-21: Technical Assn. of Pulp and Paper Industry, Annual Meeting, Commodore Hotel, New York, N. Y.

MARCH 16-18: American Institute of Chemical Engineers, Atlanta Biltmore Hotel, Atlanta, Ga.

MARCH 24-26: The National Paper Trade Assn., Annual Meeting, Waldorf-Astoria, New York, N. Y.

MAR. 26-28: Woodlands Section, Canadian Pulp and Paper Assn., Annual Meeting, Mount Royal Hotel, Montreal, Que., Canada.

MAR. 30-31: Packaging Machinery Manufacturers Institute, Semi-Annual Meeting, Hotel Dennis, Atlantic City, N. J.

MAY 5-8: Third Coating Conference of the Technical Assn., of the Pulp and Paper Industry, at the Sherman Hotel, Chicago, Ill.

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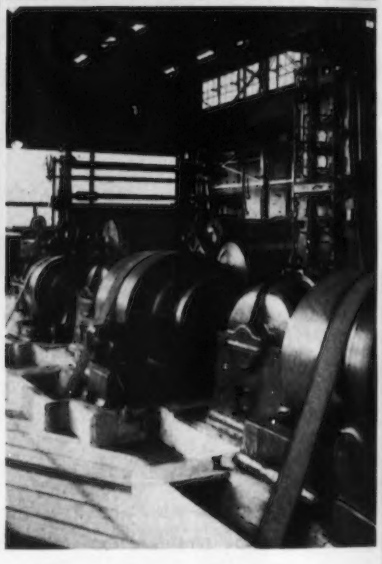

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It has to be a precision mechanism, with all operating parts in perfect balance to assure smooth, vibrationless operation.

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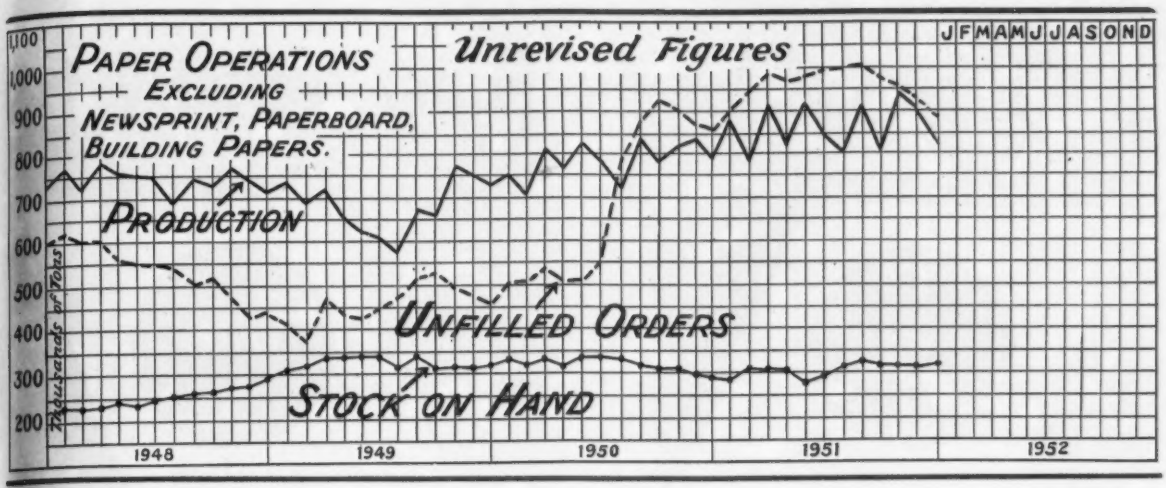
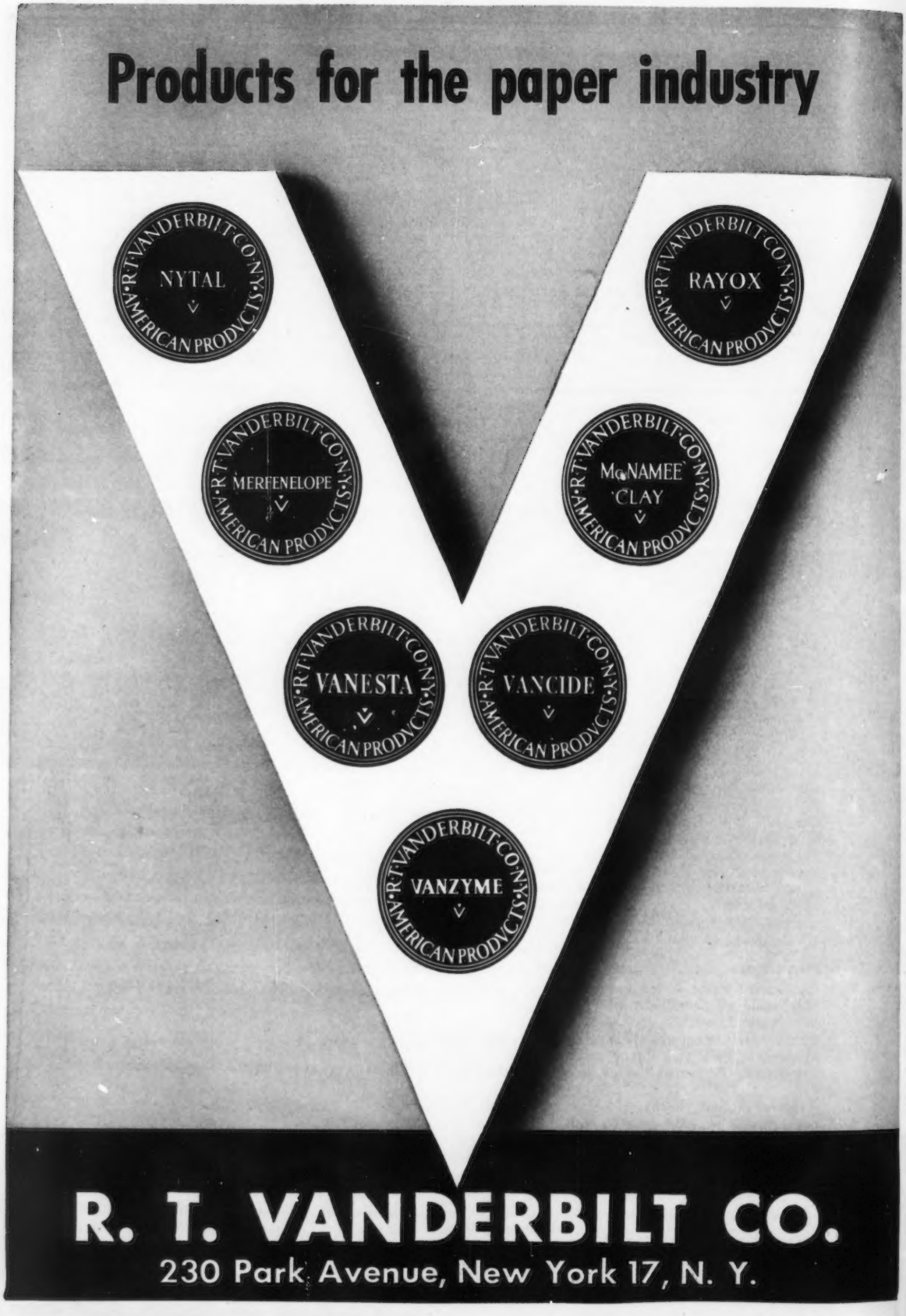
OUR BUSINESS



Brief of Important Figures

Source	Production	WEEK ENDING Jan. 19, '52	Dec. 22, '51	Jan. 20, 51
APPA	Paper Production Percent Capacity[3]	99.1	97.4	101.3
	Unbl. Kraft Paper Production Percent	97.4	104.4	93.3
NPA	Paperboard Operating Ratio Percent Inch Hours	85	86	104
		Dec. 1951	**Nov. 1951x**	**Dec. 1950**
APPA	Paper Production* (Except Newsprint and Building Papers) ..... Tons	837,000	897,269	795,000
	New Orders ..... Tons	807,000	819,334	792,000
	Unfilled Orders ..... Tons	884,500	914,463	862,300
	Shipments ..... Tons	836,000	881,877	805,000
		Dec. 1951	**Nov. 1951**	**Dec. 1950**
NPA	Paperboard Production ..... Tons	757,914	794,359	862,905
	New Orders ..... Tons	768,320	685,733	778,394
	Unfilled Orders ..... Tons	358,720	365,363	617,245
	Our Customers Activities Index[1]	**Latest Mo.**[c]	**Previous Mo.**[c]	**Year Ago**[c]
FRS	Manufactures Total Index	228	230	226
	Durable Mfg. Index	275	275	260
	Nondurable Mfg. Index	189	193	197
	Chemical Products Index	302	304	284
	Mfg. Food Products Index	160	176	163
	Printing and Publishing Index	183	181	182
ODC	Magazine Advg.-Printer's Ink Index	347	403	342
	Retail Sales Combined Adjusted Index	385.0	382.2	350.3
	Drug Index	250.0	253.1	231.5
	General Merchandise Group Index	406.2	399.0	371.2
	Grocery and Combination Index	459.1	445.9	401.8
	Prices Index			
BLS	Consumers Price Index[1]	188.6	187.4	176.4
	Wholesale all Commodities[2]	178.3	178.1	171.7
	Wholesale Foods[2]	188.8	189.4	175.2
	Commodities other than Farm Products and Foods[2]	166.9	166.7	163.7
	Wholesale Pulp and Paper[2]	201.1	200.5	178.7
	Purchasing Power of Dollar, Consumers Prices[1]	53.0	53.4	56.7
	General Activity Index			
FRS	Mfg. Production-Worker Payroll	429.4	432.7	414.6
	Unemployment Compensation Initial Claims (M)	948	902	907
	Miscellaneous Carloadings–Thousands of Cars	1,524	1,664	1,570
	Electric Output (Million KW hr.)	37,313	37,775	34,101
PTJ	Average 32 P & P Common Stocks as of Jan. 26	$37.83	$37.48	$36.11

[1] 1935-39 = 100 Unadjusted Index.
[2] 1926 = 100.
[3] New 6-7 day basis.
* For details see APPA Monthly Statistical Summary—December 1951 Estimated Figures.
[c] Latest Month Available on Request.
x Revised figures.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Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, January 30, 1952.

Growing softness in southern unbleached kraft has industry men urging on Washington the need for removing this grade from export controls to keep producing mills operating full-time.

Involved in the current market fluidity are board mills which are running at about 90 percent of capacity. Instances of temporary shutdowns are reported with more in prospect if demand for board does not pick up and if no market is found for the pulp.

Where conversion of output to standard weights of wrapping paper is economical—and this is not practicable on all machines—no loss of time will result till consumer stocks are rebuilt to a satisfactory level. Such a condition has not existed since the post-Korean boom.

On the other hand, cutbacks in civilian production, lighter consumer buying, new board capacity, and the lag in the Defense Program add up to abundant supply of container boards.

Prospects For Early Boom Dim

In proposing to NPA the removal of unbleached kraft pulp from export quotas and licensing, the industry for the most part sees the condition as a temporary one. Business generally looks for a better second half-year, basing its hope on a revival of civilian buying power through increased earnings from Defense industries, as well as tapering of long-term payments on refrigerators, cars, television and other hard goods, bought in post-Korean scare-buying waves.

With the announcement that the peak of Defense spending has been postponed a year, these hopes for a sharp lift in consumer demand are much less bright. At least some in official Washington see "the economy stalled on dead-center with a downward trend likely."

Defense Peak Due in Fiscal 1953

Revision of the program to bring the peak of the Defense Program to the fiscal year beginning July 1 was announced to the Joint Congressional Committee on the Economic Report by Charles E. Wilson, Director of Defense Mobilization, on January 26. Original schedules, Mr. Wilson testified, failed to take into consideration the essential raw materials and the time involved in designing and developing improved weapons and airplanes. The additional year will result in more and better weapons, and a whole lot more value for the taxpayer's dollar.

Market Demand and Controls

With the exceptions of printing papers, kraft wrapping and bag stock, demand has settled from the high pressure levels. Many mills are still holding to customer allotments on these items, but shifting and reselling is frequent. Some producers have abandoned allotments entirely.

If—and the international if's are still brewing—the months of 1952 follow this pattern, there shortly will be a satisfied inventory position even on these latter items, with kraft likely to be the first to reach satiety.

Since printing stock for advertising is the ammunition of a buyer's market, demand for certain book grades will be at peaks for a little longer. Cash will be freer in some areas and may divert to soft goods buying, but programs to woo that cash into Government Bonds will swing into high tempo, a further check against our enemy, Inflation. No overall relaxation of controls is indicated till that battle is won. Some easing is indicated in certain segments of industry, particularly in price control, Retiring Price Administrator Michael V. Di Salle told Congress this week.

Pulp Controls Under Pressure

Against this background of Washington thinking, pressure from various groups is considered the expected reaction from a free-enterprise system. Reasonable presentations of area conditions are being studied, it is said, and some changes are to be announced shortly.

So far as all this relates to the problem of pulp supply and export trade, there is more to the argument. Kraft papers and boards also can find an export market without export quotas and licensing. However, kraft liner has a ceiling of only $117.50 while domestic unbleached kraft pulp is better priced at $132.50. At such a price, the pulp is much wanted by several world markets which have not been buying from the U. S.

Granted that many world markets are interested in buying at the lowest world prices. Granted that these are the areas in which U. S. output must now and in future be considered a factor. Yet trade officials speak of complaints about the poor quality of pulps being shipped to foreign markets, and report anxiety that confidence in the U. S. product is being destroyed.

Industry Exporters Protest

Reported here in export and industry groups is that newcomers to wood pulp export are being recommended to the market and are getting precedence in export licenses over established houses. Pointed out by the industry is that on the first business day of January, first quarter quotas were filled, all licenses granted, to other than established wood pulp exporters. There is evidence that OIT set out to improve charges of tardiness and this time well overshot the mark.

So far as pulp quality complaints are concerned, it should be said that international wood pulp trading is hardly the field for an amateur. Like this year's graduate, his greatest fault lies in the fact that he doesn't know how much he doesn't know.

Requirements for Licenses

Requirements for prompt consideration of license requests are given as these: (1) the exporter must present evidence of a firm order, also assurance of availability of pulp to fill the order; (2) he must also comply with OIT requirements concerning end-use, and submit other documentary requirements; (3) if exporters wish to claim preference on a basis of historic export pattern, they should file such a record with OIT.

Increase in First Quarter Quotas Coming

Creditable reports are to the effect that an additional 25,000 tons of unbleached kraft pulp shortly will be authorized for first quarter exports.

New M-72 Revisions Considered

Southern board mills and exporters are not alone in their anxiety to see some revision in M-72 controls. Mills and their agents which are having difficulty selling contract tonnages ask that usage clauses and inventory limits be removed to allow consuming mills to stock up with available lots of unbleached sulfites against market firming. Spots of easing in bleached sulfites are spoken of.

Industry Advisory men indicate a reluctance to make any general change in M-72 until all market pulp consumers have an adequate stock of bleached grades.

At the close of December, however, 91 mills had much, much less than the 45-day inventory allowed, probably in the bleached grades. For those marginal mills operating more or less normally on a four-day week, it is recognized that not only is a 30-day stock fairly hefty, but there often is neither cash nor desire to buy more.

Arguments to permit an increase in usage falls on somewhat barren soil, in view of the dropping demand for paper and products, and is therefore viewed in NPA circles as pressure from an over-anxious mill agent.

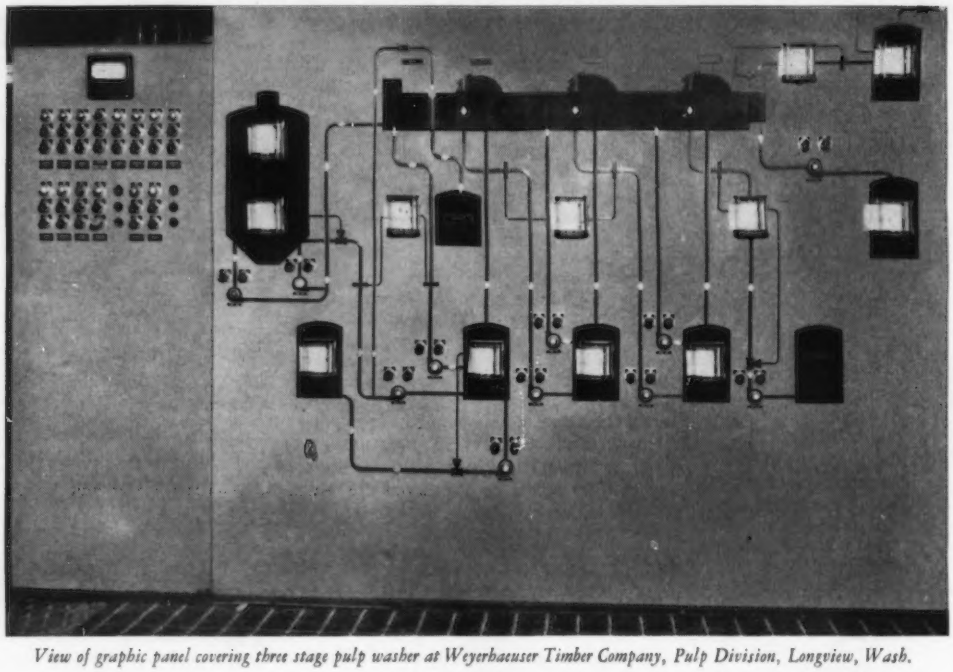
Some changes already have been made in the original order, others are in the making, as witness the announcement that the Wood Pulp Industry Advisory Committee is meeting with NPA as we go to press.

—E.P.N.

Paperboard Production (Tons)*

	Jan. 12 1952	Jan. 12 1952	Jan. 20 1951
Production	204,021	210,349	244,416
New Orders	193,052	195,092	218,278
Unfilled Orders	392,482	405,521	705,371
% of Activity	85	86	104

* Source: National Paperboard Assn.



View of graphic panel covering three stage pulp washer at Weyerhaeuser Timber Company, Pulp Division, Longview, Wash.

The whole picture of pulp washing at Weyerhaeuser!

Here's the whole graphic picture of the pulp washing process, from the blow tank, through the knotter, and the three stage washer to the brown stock storage tank. All shown by Taylor TRANSET* Recorders on a Taylor Graphic Panel at Weyerhaeuser Timber Company's Longview, Washington, plant.

By looking at this one panel, the operator can tell the level and consistency in the blow tank, flow of all the liquor to all stages of washing, level of the liquor in all three filtrate tanks, level in black liquor storage, level and flow of the white water, and level in the brown stock storage tank.

Taylor controls automatically regulate consistency in the blow tank, flow and tank level of the liquor wherever required, and flow and level of the white water.

One man can keep tabs on the entire process and, with the help of Taylor Controls, keep flow and level at all stages just where he wants it. In fact, a single operator started up this new plant in five minutes, without an error.

This is the most fully graphic panel we know of in the paper industry . . . just one example of how Taylor Controls are bringing increased efficiency to all phases of paper manufacture. Ask your Taylor Field Engineer, or write: Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

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Paper TRADE JOURNAL

Emphasize Research and Development at CPPA Meeting

The thirty-ninth annual meeting of the Canadian Pulp and Paper Assn., and the thirty-eighth annual meeting of the Technical Section were held on January 23-25, at the Mount Royal Hotel in Montreal. Registration for the Technical Section meeting was approximately 850.

Pulp and Paper and the Future

Address by R. M. Fowler, president, Canadian Pulp and Paper Assn., at the Association's Annual Luncheon, Montreal, January 25, 1952.

R. M. Fowler
President
Canadian Pulp & Paper Ass'n.

You will find at your places a printed copy of my report on the achievements of the industry and the activities of the Association in 1951. I do not propose to read it today, or to attempt to summarize the story it tells. This is history which you may possibly read later and consult from time to time. With the story of the past year before you in printed form, I can confine my remarks today within a shorter compass than in previous years and deal only with three or four points that might concern this industry as it enters 1952.

I need only say that the record of the pulp and paper industry in 1951 was a remarkable one. The output of all grades of pulp and paper increased materially in the past year and reached new, all-time records. The gross tonnage of all products amounted to 9,600,000 tons, an increase of nearly 9 percent in physical volume over the previous year. The gross value of this production will amount to some $1.2 billion; and at the year end all branches of the industry were operating at virtual capacity. In 1951, Canada, which for years has been the largest exporter of newsprint, became also the leading exporter of pulps in the world.

I will add only one other word about the printed report and say that you will find some reference to the work your Association attempts to do and the kind of service it can perform for you. That reference is probably inadequate in that it does not emphasize that the real measure of the Association's value is the degree to which individual members contribute in interest and work to its activities. It is perhaps the old business of getting out of an enterprise precisely what you put into it. Whenever the brilliant idea occurs secretly to each one of a group of partners that the niggardly character of his little contribution will be lost in the general fund of honest work, there are likely to be surprising and unfortunate results. I might illustrate this by the story of the Scottish congregation which wanted to do honor to a beloved parson who had served with zeal and devotion for many years. After anxious and prayerful consultation, they decided that the most suitable token of their esteem would be to present the old minister with a barrel of whiskey. It was further decided that the best way to provide the gift was to have contributions collected in kind. Accordingly, an empty barrel was set up and each member of the flock poured his offering into the open bunghole. It was then sealed until the great day of presentation arrived when the whole congregation assembled to do honor to their spiritual guide. Of course, the anticipation was not lessened by the fact that there would necessarily be a general sampling of the presentation. It was a solemn and exciting moment when the senior elder turned the spigot. But lo! there flowed forth pure water.

I must hasten to add that the contributions made in 1951 to the Association by its many members were spirited and fully up to proof. And I have every reason to believe that, in 1952, they will be equally strong and palat-

able. But it may be well to warn against the possibility that any holding back by individual members in performing their share of the common undertaking will only lead to a weak and watered-down brew for everyone.

Where does this industry stand today? Where does Canada stand today? Those two questions are almost the same. For Canada cannot be prosperous unless this pulp and paper industry is prosperous; and this industry cannot be soundly healthy unless the Canadian economy is in good case. I am glad to say that, in spite of some problems and anxieties, we are in a most fortunate position today. The industry has strengthened itself in the past year; it has developed soundly; it has faced its problems generally with wisdom; it seems to have assimilated substantial growth without becoming weak and disjointed in the process; it stands more broadly-based and, I believe, has stronger sinews than it had a year ago. And in this it has matched the general growth and strengthening of the Canadian economy in 1951.

I sometimes wonder if we realize what is going on in this country. There is an economic revolution taking place before our eyes and perhaps we do not see it.

No one admires more than I do the industrial genius of the United States. Especially when they are spurred by emergency, our neighbors can turn in a spectacular performance; and they are doing it now. But, without any boasting or invidious comparisions, the cold statistics show that Canada is moving forward at an even faster rate. Since the end of the war the basic forces of expansion in Canada have been relatively stronger even than those in the United States. There has been more rapid development of natural resources, a more rapid rate of capital formation, a higher birth rate, and greater immigration.

There are a few comparative figures of growth in the two countries between 1939 and 1950 which are interesting. Between the two years, Canada's population increased 22 percent while the U. S. population rose 16 percent. Employment in manufacturing rose 85 percent in Canada as compared to 58 percent in the United States. Investment in plant, equipment, and housing increased in value between 1939 and 1950 by 471 percent in Canada and by 370 percent in the U. S.; and in volume terms these physical investments rose 168 percent in Canada compared to 138 percent in the U. S.

One other figure that summarizes the comparison is that of gross national product, expressed in constant dollars. The Canadian gross national product was 81 percent greater in 1950 than it was in 1939, while the U. S. gross national product was 69 percent higher. The past year in Canada saw an even faster increase; the latest figures indicate a rise in Canadian physical production in 1951 of between 5 and 6 percent over 1950 which compares with a 12 percent increase in the four years between 1946 and 1950. This is a remarkable picture of a nation's economic growth.

In the many year-end reviews in Canadian periodicals, much has been said about this rapid expansion of the Canadian economy. But there is a strange thing about these surveys. They all talk — and rightly so — about the importance of oil developments in Alberta and iron ore developments in Labrador. But all the reviews that I have seen practically ignore the greatest industrial event that is happening today in Canada: the development and expansion of Canada's pulp and paper industry. Perhaps, because it is an established and familiar industry it gets less attention than new, and somewhat unexpected developments. But the fact is that this industry is more than keeping pace with the rapid growth

Douglas W. Ambridge
Retiring Chairman

of Canada's economy and is retaining its leading position in that economy, measured by any terms you may choose to select. This industry remains first in employment, first in total wages paid, first in export values and value of production, and first in capital invested. The total annual value of pulp and paper production exceeds the value of wheat and all other grains combined; it is about equal to the value of Canada's total mineral production including gold; and it is close to twice as great as the production value of the automobile industry. Its exports were about $900 millions, and provided 24 percent of all Canadian exports and 35 percent of all our exports to the United States.

Perhaps the best measure of the growth of an industry is its rate of investment. Official government figures show a total new investment in pulp and paper mills between 1946 and 1950 of over $360 millions, of which about $130 millions were for construction and $230 millions for machinery and equipment. This investment occurred in an industry which in 1945 was capitalized at about $750 millions. But the future appears to be even more interesting. A short time ago we made a survey through the Association, which naturally covered only existing manufacturers, of plans for investment in the last half of 1951 and the year 1952, to include completions in 1953 but not new starts in that year. For this period the total new investment, apart from large sums for repairs and maintenance, came to $245.5 millions. If the results of this survey for 1951 to 1953 are projected arithmetically for a five year period, we get a total investment for existing manufacturers of about $500 millions. In addition, we know of new entrants — and fortunately there are such new entrants — with announced projects totalling $121 millions. Thus it is not unreasonable to expect in the five year period between 1951 and 1955 a total new capital investment in pulp and paper facilities of over $600 millions. This in dollar terms is a rate 70 percent greater than the growth in 1946-50, and in volume terms 35 percent greater than that which occurred in the first five years after the war.

If this estimate of investment in the pulp and paper industry in the next five years is at all realistic, it is the biggest thing going on in Canada today. I have a few government estimates of investment plans in other industries for comparison. Over the same period 1951-55, aluminum smelting will require $233 millions; other non-ferrous metals $150 millions; iron ore $226 millions; chemicals $127 millions; petroleum and natural gas exploration and development $300 millions, and transmission and refining $213 millions. Thus the $600 millions of projected investment in pulp and paper production exceeds any one of these other major developments and amounts to nearly half as much as all of them combined.

Now these figures naturally raise some important questions. Is this rapid growth sound? Are we going too far, too fast? Will this be over-expansion? Are the mistakes of the '20's going to be made all over again? No one can guarantee the answers. Much depends on what happens to the world, politically and economically; and much depends on whether your point of view is optimistic or pessimistic for the next five years.

But there is one basic fact that distinguishes conditions in this industry today from those that existed 25 years ago. It is the fundamental change that has taken place in the relationship between world demands for pulp and paper and wood resources. The demand for cellulose products is today a very different thing from what it was in the twenties. There are many new uses for wood fibre and more are developing daily; rayon, cellophane, packaging materials, paper milk bottles are a few examples. And old and familiar uses are also demanding more; newsprint is a good example of the growth of demand as populations grow and living standards and literacy improve. With this growth in demand for both new and old uses of wood fibre, all over the world the limits of wood supply have been reached. In many other

countries, expansion of pulp and paper production is nearing an end because of lack of additional trees. This is particularly true of the other great exporting areas in Europe and the Scandinavian countries. Canada is more fortunate. Although statistics of wood inventories and rates of growth are unfortunately incomplete, everything indicates that the Canadian wood potential is far from exhausted. Government foresters believe that the volume of annual growth exceeds total annual depletion from all causes. On lands under lease to pulp and paper companies, the 1950-51 cut, which was the largest in history, amounted to one-eighth of a cord per acre over the 140,000 square miles under lease. All scientific measurements indicate that average regrowth is greater than this use together with natural losses from fire, insects, and disease on the leased areas. To the extent that these losses can be reduced, and to the extent that areas now classed as inaccessible can be economically brought under cultivation, more pulpwood in perpetuity will become available to meet rising domestic and world demands for pulp and paper. In other words, I believe that the danger of over-expansion of this industry is very much less than it was 25 years ago because the world is constantly demanding more and more pulp and paper products, and, with wood shortages in other countries, the world must turn to Canada for an increasing percentage of this increasing demand. Canada has a relatively greater place in a much larger picture.

The prospect ahead for this industry, over the next four or five years, is one of vigorous and rapid growth. It is natural to ask what the problems will be and what are the dangers that may destroy these expectations. One is, of course, a failure of demand for our products, and I must say frankly that we should expect some dips and fluctuations in demand. It is unreasonable to count on a steady, uninterrupted rise in demand or to hope that new capacity will always come into production at the precise moment when it will be fully taken up. I think that the long-range trend is undoubtedly upward and that the dips and recessions will be of short duration. A great deal will depend on the maturity and patience with which these periods are faced by the industry. This is a problem of competent management and management and merchandising skill; a question of members of the industry being able to take individually the wise, long view rather than the short, panicky approach. It must be remembered that these management skills have not been put to the test in the last ten years. And — let me say it bluntly — the earlier record is not very encouraging. It is often said that the pulp and paper industry suffered from over-expansion in the thirties. It did no such thing; it suffered from a failure of management. To be sure, there were problems created by the shrinkage of demand, but these problems confronted other industries which were able to avoid calamity. The lowest point for the Canadian newsprint industry came in 1932 when the operating rate fell to 52.8 percent of capacity. In the U. S. steel industry the operating rate fell in that year to 19.5 percent of ingot capacity and remained for five years below 50 percent. The U. S. steel industry did not go broke; the Canadian newsprint industry did. The one management somehow was able to escape disaster; the other through inexperience, distrust, or some other cause consistently courted it. Fortunately, it is unlikely that this industry will again be faced by so severe a test, but some such tests may come. I believe myself that they will be wisely faced; that management is today more experienced and the industry itself more diversified; that relations within the industry are less riddled with distrust and suspicion. If

E. M. Little
Chairman

these things are so, I am confident we will weather successfully whatever minor squalls may come.

Another problem confronting the growth of the industry in the next few years will be the difficulty of getting essential materials and equipment, resulting from the claims of the defense programs. These shortages of steel, base metals, and manufacturing capacity may cause delays, may slow up the pace of expansion; but they will not prevent the growth taking place. We recognize the need for the Canadian government to give first place to direct defense requirements; we believe that, when defense needs are met, the Canadian government will recognize the importance and desirability of pulp and paper development.

The one other major threat to the growth of this industry is one that is beyond its power to control. To expand to meet demands for pulp and paper products, large sums of money are needed — over $600 millions in the next five years. Much of this must come from profits, net profits after taxes. If taxation cuts drastically into profits, it may not be possible to retain in business, or to borrow outside enough money to support the desired capital investment program. In the years 1945 to 1950, for a representative group of 12 companies in this industry, 61 percent of net profits were retained in the business for development purposes. These amounts provided 90 percent of the increase in net worth of these companies in the period. Thus it is safe to assume that the major part of the money invested in this industry since the war came out of earnings from the sale of its products.

I firmly believe that the members of the pulp and paper industry recognize the need of supporting loyally and fully the defense program by the payment of taxes. I think they would endorse the policy of pay-as-you-go for defense expenditures. But, with many other people, they can question the wisdom of building up large government surpluses. There is much to suggest that the taxes which produced these surpluses have had an unexpected inflationary effect. There is much to suggest, also, that taxes on corporations and individuals have reached, or passed, the point of no return. Further increases, and possibly present levels of taxation, are likely to defeat themselves by robbing corporations of the money to expand and individuals of the money to buy and the incentive to produce more. Certainly in this industry, unless net profits can be maintained through increases in sales returns, the re-investment in new facilities will be retarded and great opportunities may be lost. The full impact of present individual income taxes may produce further wage increases and thus start going the inflationary spiral that now appears to have been halted.

I hesitate to enter the difficult and contentious field of tax policy, but I have one suggestion to offer for your consideration. Since the war, Canada has enjoyed a period of great prosperity and government revenues have been such that major reductions in the naitonal debt have been made. Moreover, the base of national assets and population to support that debt has been greatly expanded. In 1951 we entered a bulge of defense spending that may last for three or four years. During such a period, taken as a whole, it is questionable if further reduction in the national debt is wise or necessary. The net inflationary or deflationary effect of government surpluses resulting from high taxes is at least open to argument. Would it not be a wise policy to aim at an evenly balanced budget over the whole period of defense build-up? If this policy were adopted, the current government surplus becomes an advantage rather than a disadvantage, and on all counts, less embarrassing. Canada will have in hand, during the present fiscal year, possibly $500 millions which could frankly be applied to restrict and reduce taxation in the next two or three years. At the end of the period of defense build-up, we would emerge with the same national debt as we have today and the foundation to support it would be stronger and broader. No one can be quite certain of the total

effect on the Canadian economy of substantial government surpluses; there are no yardsticks to determine how large such surpluses should be or the point at which they will become more inflationary than deflationary. For the pulp and paper industry, I believe that the tax policy I have suggested would mean less interference with necessary and desirable capital expansions, and less pressure for wage increases to recapture tax increases and therefore less danger of further inflation.

Turning from this rather dismal subject of taxes, I would like to ask you to consider for a moment a question of broad economics that affects all of Canada and particularly the pulp and paper industry. I suspect that a development has taken place throughout the world that has largely gone unnoticed, and it may have great importance in any assessment of the economic future of a country like Canada. It concerns the relative place, and the relative take, of the producer of raw materials and basic commodities.

Every trading dollar coming from the ultimate consumer is divided between the raw material producer, the basic fabricator, the converter, and the distributor in proportions that are determined by the competitive claims these various groups are able to put forward. Up to a very short time ago, the producer of raw materials — and I am not now talking of wood or pulp or paper but of raw materials generally — was in a relatively weak position. This was because most raw materials were generally suffering from surpluses throughout the world and we had a host of international control schemes by which governments sought to keep down production and share the raw material markets. As a result there was a scramble to get into the more profitable end of the business scale, the conversion of basic materials and the manufacture and distribution of end products. The cry was, "We don't want to be hewers of wood and drawers of water." The raw material producer and the basic fabricator tended to be regarded and to regard themselves as belonging to an inferior breed.

A.P.W.

ONLIWON

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Elected Officers

Officers of the Canadian Pulp and Paper Assn. elected at the annual meeting on January 25:

Chairman of the Executive Board: E. M. Little, president, Anglo-Canadian Pulp and Paper Mills Ltd., Quebec, Que.

Vice - Chairmen: D. W. Ambridge, president, Abitibi Power and Paper Co. Ltd., Toronto, Ont.; H. S. Foley, president, Powell River Co. Ltd., Vancouver, B. C.

Honorary Vice - Chairman: C. R. Whitehead, Montreal, Que.

I wonder if these attitudes are any longer sound. All over the world, as populations have grown and standards of living have risen, the surpluses of raw materials have been transformed into shortages. No doubt surpluses may turn up occasionally but they are likely to be temporary. The long-range trend is one of mounting pressure on the supply of raw materials. If that is so, the competitive position of the raw material producer and the basic fabricator is growing stronger. His position and his rewards seem likely to grow, both absolutely and relatively.

Now, of course, this does not mean that there should not be a steady development of manufacturing techniques and new end-products in this industry. Nor does it mean that for a particular company, special factors may not call for a move toward more specialization. For old machines it may be desirable to develop in this direction. But even if this should be done with existing machines, I wonder if it would not be wise to fill in behind these developments with new modern machines to operate efficiently in the area of basic manufacture. Certainly no general answer to this problem can be made and I can only put forward the idea to you to think about.

I can only say that if there is anything in my theory that the economic advantage is swinging to the producer of raw materials — then Canada is going to be quite a place.

D. W. Ambridge Gets Award and Citation

At the annual luncheon of the Canadian Pulp and Paper Assn., held January 25, Douglas W. Ambridge, president, Abitibi Power and Paper Co., Ltd., Toronto, Ont., received a special medal award and citation on his retirement as chairman of the association's executive board in 1951. L. J. Belnap, vice-chairman of the association and chairman of the board, Consolidated Paper Corp., Montreal, presented the award to Mr. Ambridge.

The citation accompanying the award stated that on the resolution of the council, the association was awarding the medal to Mr. Ambridge in recognition of the many benefits to the Canadian pulp and paper industry brought to effect by him during his tenure of office. An active figure in the industry all his life, a proponent of greater effort in the development of research and whose interest in the industry is truly continent-wide, the citation said Mr. Ambridge had given generously of his time and talent to the association's affairs and to all interests of the industry as a whole.

Book and Writing Section

Shipments of book, writing and fine papers by Canadian mills to the domestic market in 1951 topped all previous records, said W. H. Aird, sales manager, Howard Smith Paper Mills Ltd., Montreal, and chairman of the book and writing section, in his annual report.

Substantial capital expenditures made by the industry resulted in increased production, thus enabling it to meet the very strong demand for all grades in a reasonably satisfactory manner.

Export shipments were also increased during the year, said Mr. Aird, but they were not commensurate with the increased demand for Canadian products in overseas markets.

Further plans of various mills to produce additional tonnage are nearing completion, he reported. This should permit them not only to meet adequately the demands of the domestic market, including defense requirements, but also to increase shipments abroad substantially.

Woodlands Section

In 1951, the Woodlands Section, one of the two scientific societies under the aegis of the association, held field meetings on forest fire protection, silviculture, mechanical hauling of pulpwood and cable yarding of pulpwood, and ninety papers on a wide variety of subjects were issued to the 902 members, said the section chairman, Gordon Godwin, assistant general manager, woodlands, The Ontario Paper Co. Ltd., Thorold, Ont., in his annual report.

The Section's fourteen committees studied various problems, including special pulpwood cars, aerial surveys, nutrition, sleighs, cutting tools, farm woodlots, silvicultural matters and other subjects. Through such study and research, improved methods of forest management are developed.

The section's council considered, among other items, pulpwood insurance, rail car supply, and industry labor and pulpwood requirements.

Arrangements were concluded with the Pulp and Paper Research Institute of Canada to conduct a three-year research project into the problem of containing wood in holding grounds.

Prompted by a threatened shortage of equipment and parts, and to pro-

vide data on equipment usage in the event priorities assistance was required to keep production machinery in operation, the Section conducted an equipment survey. From the data obtained, Mr. Godwin said that the total number of all kinds of machines used by the industry is now almost triple the number used five years ago. The dollar value has increased five times, and the industry now uses ten times the number of trucks.

Board Section

Canadian production of paperboard in 1951 was at an all-time high of 760,000 tons, exceeding the 1950 tonnage by 7 percent, said F. F. Arnoldi, chairman of the board section, Canadian Pulp and Paper Assn., and sales manager, boxboard division, Hinde and Dauch Paper Co. of Canada Ltd., Toronto, Ont.

Demand for all grades of paperboard was at record levels until July, when demand for boxboard eased, but continuous heavy requirements for container materials was maintained, Mr. Arnoldi reported. In the latter part of the year, there was an increase in export demand for paperboard. To meet the demand, both at home and abroad, the industry increased its capacity, but the planned installations of some mills were retarded by slow delivery of equipment.

With the proposed increases in productive capacity, the industry should be able to meet all paperboard demands for defense purposes in 1952 without affecting nondefense supply.

Specialty Papers Section

In 1951, the demand for Canadian specialty papers was greater than in any pervious year, said G. W. Earnshaw, chairman of the specialty papers section, and manager, fine and specialty papers, The E. B. Eddy Co., Hull, Que., in his annual report for the section.

The industry met this demand with increased production, he reported, and there was no evidence of any acute shortage of paper during the year.

The mills have been and are concerned, however, with rising costs, said Mr. Earnshaw. Their concern is especially in regard to the importance of arresting inflationary trends and the maintenance of present standards of quality.

Traffic Section

The Canadian pulp and paper industry's freight bill in 1951 was about $200 million and there was an unprecedented movement of the industry's raw materials and finished products, said W. B. Daley, chairman of the traffic section, and traffic manager, Canadian International Paper Co., Montreal.

In his annual report of the section's activities Mr. Daley said that some 275,000 car loads of pulpwood were carried by the railways during the past year and some 250,000 carloads of pulp and paper were shipped from the mills. In addition, there was a sharply increased volume of waterborne tonnage.

For the first three months of 1951, the car supply situation at times was extremely grave, and maintenance of operations was seriously threatened at certain mills where storage facilities were taxed to the limit. However, in the last nine months of the year, the situation improved and car supply was reasonably adequate.

S. Ferguson
Guest Speaker

D. H. O'Brien

Wrapping Paper Section

The demand for wrapping paper in 1951 increased at a fairly even rate, and production was increased by about twenty percent as compared with 1950, said J. O. Chenevert, chairman, wrapping-paper section, and vice-president, Consolidated Paper Sales Ltd., Montreal, in his annual report for the section.

There are prospects for a further small increase in production in 1952, he said, and the demand for wrapping paper should continue to be good.

"The manufacturers," said Mr. Chenevert, "are mindful of the requirements brought about by the national defense program and naturally the industry will, as usual, give priority to essential national defense and civilian requirements."

Lew Corcoran

Chemical Pulp Section

The production of chemical woodpulp in Canada in 1951 exceeded the all-time high established in 1950 by over fifteen percent and the total of all grades approached a record figure of close to four million tons, C. M. Matheson, manager, pulp and paperboard sales, Fraser Co., Ltd., Montreal, said in his annual report as chairman of the chemical pulp section.

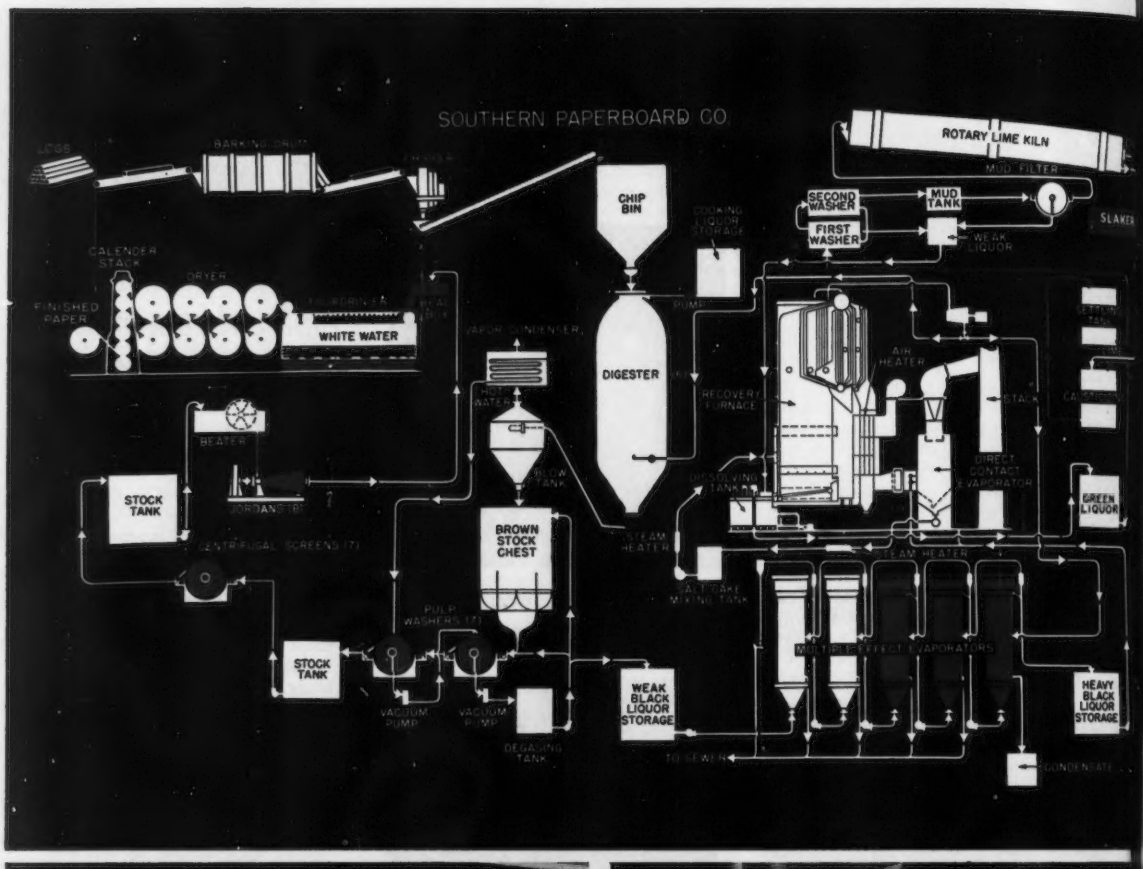
All grades participated in this record production, he said. However, the most notable increases in production were in unbleached sulphite and bleached and unbleached sulphate. Increases in the latter two grades reflected the new capacity brought into production during the previous year.

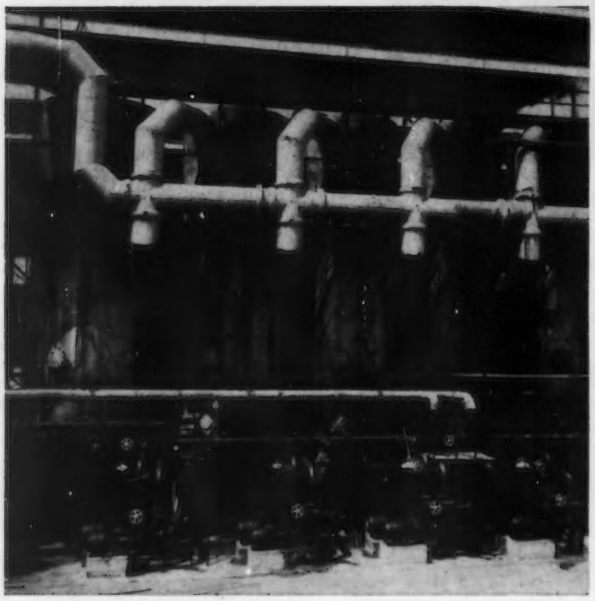
The only new capacity added in 1951 was the new bleached sulphite mill of Columbia Cellulose Co., and the reopening of an unbleached sulphate mill, which had been idle for several years, by Howe Sound Pulp Co. Both these plants are on the west coast. Other than this, the increased production was effected by modernization of equipment and more efficient operation of existing units.

"It does not appear that world supply has yet caught up with world demand," said Mr. Matheson. "However, the indications are that the position was in relatively better balance at the end of the year than at the beginning."

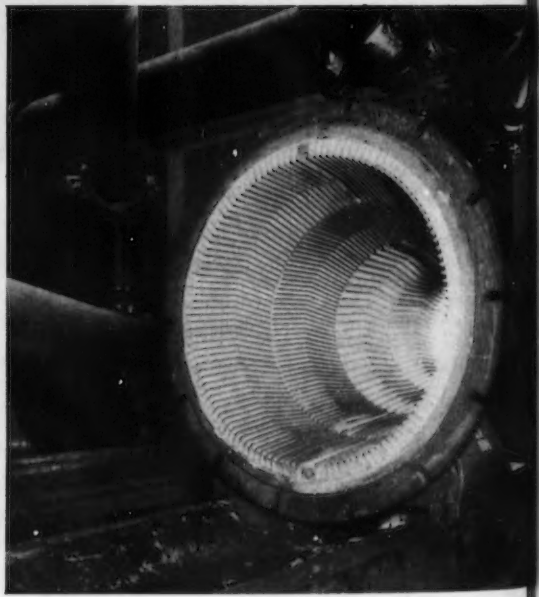
John Eyton

How SOUTHERN PAPERBOARD





The first three effects of this multiple-effect evaporator each contain 1,050 2" x 22' Stainless Steel tubes. In the first effect, Stainless has already outlasted the material it replaced, and appears good for many months of additional service.



Stainless Steel bars in one of the 14 Jones Majestic Jordans in Southern Paperboard's mill. Bars are sanded and straightened about every months, but their service life is considered almost indefinite.

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THIS FLOW CHART of its Port Wentworth, Ga., operation shows how heavily Southern Paperboard Corporation relies on Stainless Steel. Every piece of equipment shown in red on the chart represents a tough corrosion problem that Stainless is helping to solve.

Six digester blow valves, for example, have inner sleeves and plungers of Stainless. Steam, chips, liquor and tramp metal attack these parts heavily, but the durability and corrosion resistance of Stainless Steel permit them to withstand 6000 blows before reconditioning is needed.

Jordan shells and plugs are equipped with Stainless Steel bars. The severe cutting action, combined with small amounts of residual liquor in the pulp, puts the bars to a severe test, but they are considered to last "almost indefinitely." The only maintenance required consists of sanding and straightening every 18 months due to the effect of tramp metal.

On the liquor recovery side, tubes in the first three evaporator effects are now Stainless Steel. Other materials corroded quite rapidly, and were clogged by solid matter deposited on the corroded surfaces. Tubes in the first effect had to be replaced in 18 months, but Stainless remains in good condition after an identical period of service.

For many of the tough, highly-corrosive jobs in any mill, you can't match the performance of Stainless Steel. And you'll achieve peak efficiency when your equipment in these trouble spots is fabricated from perfected, service-tested U·S·S Stainless Steel.

Inner sleeve and plunger of this Yarway 8" digester blow valve are Stainless Steel. Closed, the valve withstands a pressure of 150 psi. Open, it passes 10 tons of wood pulp and used cooking liquor in 12 minutes.

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UNITED STATES STEEL

CPPA DINNER

Left to Right—B. F. Avery, KVP Co., Ltd., Espanola, Ont.; A. B. MacLaren, The James Maclaren Co., Ltd., Buckingham, Que.; P. Rolland, Rolland Paper Co., Ltd., Montreal, Que.; G. L. Carruthers, Interlake Tissue Mills Co., Toronto, Ont.; L. F. Winchell, Hinde & Dauch Paper Co. of Canada, Toronto, Ont.

Left to Right—E. W. Tinker, American Paper and Pulp Assn., New York; A. A. Schmon, Ontario Paper Co., Ltd., and Quebec North Shore Paper Co., Thorold, Ont.; W. H. Howard, Canadian Pulp and Paper Assn., McMichael, Common, Howard, Ker & Cate, Montreal, Que.; D. A. Gillies and S. L. De Carteret, Canadian International Paper Co., Montreal, Que.

Left to Right—E. M. Little, Anglo-Canadian Pulp and Paper Mills, Anglo-Newfoundland Development Co. and Gaspesia Sulphite Co., Ltd., Quebec, Que.; Sydney Ferguson, American Paper and Pulp Assn., and Mead Corp., Dayton, Ohio; D. W. Ambridge, Abitibi Power and Paper Co., Ltd. & Provincial Paper Ltd., Toronto, Ont.; R. M. Fowler, C.P.P.A., Montreal, Que.; L. J. Belnap, Consolidated Paper Corp., Ltd., Montreal, Que.

Left to Right—Paul E. Cooper, Pacific Mills Ltd., Vancouver, B. C.; Dr. F. Cyril James, McGill University, Montreal, Que.; R. L. Weldon, Pulp and Paper Research Institute of Canada, and Bathurst Power and Paper Co., Montreal, Que.; R. H. Evans, Olin Industries, Inc., New York; C. H. Sage, Spruce Falls Power and Paper, Ltd., Neenah, Wis.

Bottom Row, Left to Right—W. J. LeClair, Canadian Lumbermen's Assn., Ottawa, Ont.; Aubrey Crabtree, Fraser Companies Ltd., and Restigouche Co., Ltd., Edmundston, N. B.; J. B. Faegre, Ontario-Minnesota Pulp and Paper Co., Ltd., Minneapolis, Minn.; W. S. Kidd, E. B. Eddy Co., Hull, Que.; Gordon Brown, Brown Corp., Montreal, Que.; F. L. Mitchell, Canadian Pulp and Paper Assn., Montreal, Que.

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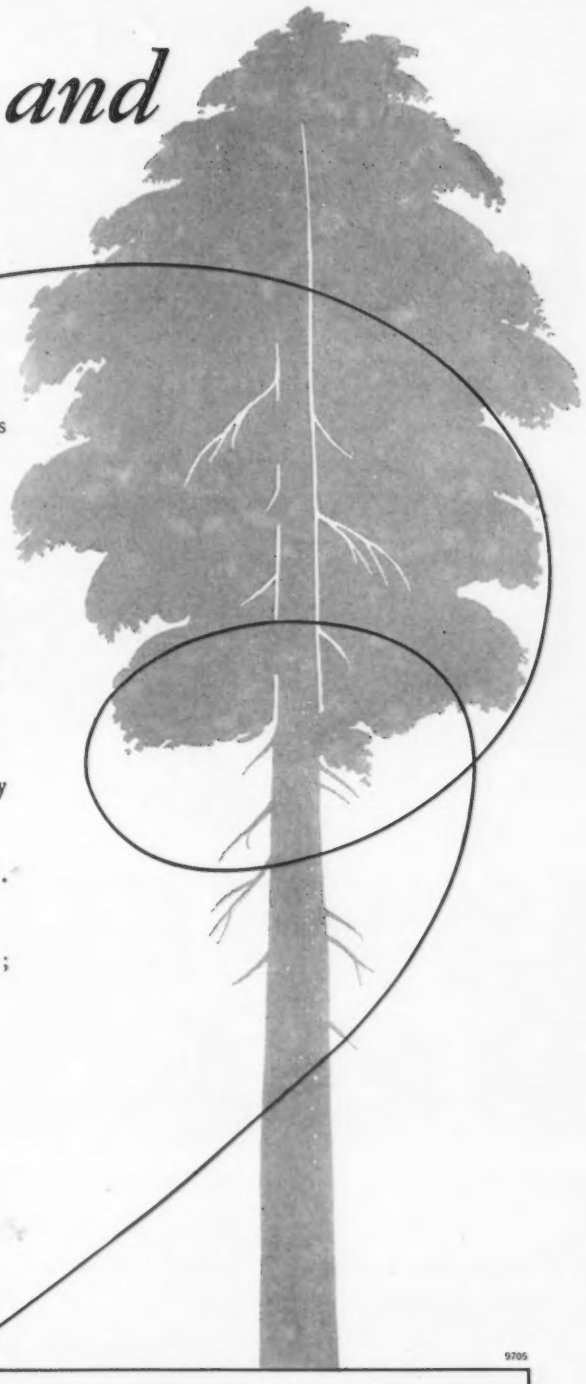

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Left to Right—E. W. Tinker, F. L. Mitchell, R. L. Fraser, R. C. Rowe, and Harold Crabtree.

Left to Right—J. B. Jones, R. G. Macdonald, Dr. Otto Maas, J. R. W. Grieve, E. W. Tinker, F. L. Mitchell.

Left to Right—T. R. Moore, Harold Baker, K. P. Geohegan, W. W. Gallay, L. R. Theismeyer.

Mechanical Pulp Section

Canadian groundwood pulp production of 5,135,000 tons in 1951 exceeded all previous records, said E. J. Thom, manager of pulp sales, Howard Smith Paper Mills Ltd., Montreal, and chairman of the mechanical pulp section.

In his annual report of the section's activities, Mr. Thom said that last year was the fifth consecutive year that groundwood mills in Canada had broken all previous production records. The increase in 1951 was approximately 5.4 percent above the record year of 1950.

Groundwood or mechanical pulp is the principal ingredient of newsprint paper and most of the output is used for this purpose. Hence, a large part of the increase was made by the newsprint mills. Their 1951 production was up by 4.6 percent over 1950.

Mills making groundwood pulp for sale in the open market or for products other than newsprint paper also reported record production last year, said Mr. Thom. Their output increased by 18 percent over 1950.

Demand both in Canada and the United States remained strong throughout most of the year, he continued. And shipments to overseas markets were considerably higher than in 1950.

Approximately 78 percent of surplus groundwood pulp of all grades available for sales in 1951 was exported to the United States and 15 percent went overseas, he said. The remaining 7 percent was supplied to the Canadian market.

Award and citation being presented to D. W. Ambridge by L. J. Belnap

Western Division

Comprising ten companies with twelve mills at the end of 1951, the pulp and paper industry in British Columbia has almost doubled in size and production over the past five years, said Paul E. Cooper, president, Pacific Mills Ltd., in his annual report of the activities of the western division, of which he is chairman.

The growth of the industry was emphasized by the opening of a new rayon pulp mill by Columbia Cellulose Ltd., near Prince Rupert; the start-up and modernization of a closed sulphate mill close to Vancouver by Howe Sound Pulp Co. Ltd.; and a combined newsprint and sulphate pulp mill under construction by Elk Falls Co. Ltd. on Vancouver Island. In addition, several mills are in various stages of revision and modernization to obtain increased production and improved operating efficiency.

To stimulate interest in accident prevention, industry-wide first aid contests were held, trophies were awarded mills with the lowest accident records, and labor management safety conferences were held.

During the year, Mr. Cooper continued, the eight companies with forest operations cooperated to launch a three years' research project on the chemical debarking of certain western pulpwood species. The investigation is in charge of Prof. D. J. Worr, department of biology and botany, University of British Columbia.

A notable event in the year, said Mr. Cooper, was the planting of an oak tree by H. R. H. Princess Elizabeth in the Queen Elizabeth Arboretum, sponsored by the western division in Vancouver.

There was a growing public interest in the industry and its operations. This was in part reflected, he said, in the greater province-wide participation in the indsutry's annual essay contest by thousands of high school students, aided by their teachers.

Consult your felt man

...before you change the speed of your machine

Every felt is manufactured to give maximum service at a pre-determined rate of speed. If you run faster than that, you automatically reduce the effectiveness of the felt and leave too much water to be evaporated at the drier rolls. Run slower and your costs per ton go up.

Right now your principal job is to increase your daily tonnage. This means that more water must pass through the meshes of your felts before the sheets go to the driers. But you can't overlook fine finish.

Here is where you need the advice of the Hamilton Felt man. He has more than 300 different styles to draw from. He knows from experience which one of these felts will be best for you. And he also knows that you will hold him responsible for the performance of the felt he recommends.

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From the thinnest tissue to the heaviest board, there is a Hamilton Felt that will do your work better, faster and at lower cost.

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SHULER & BENNINGHOFEN, HAMILTON, OHIO

Technical Section Activities

The Technical Section meeting opened officially at 9:45 A.M. on January 23, and ended with the close of the afternoon sessions on Friday afternoon, January 25. During the three day meeting, thirty formal papers were presented, as well as several informal papers and prepared discussions. There were eleven group discussions.

Awards Presented at the Annual Business Luncheon

Awards and prizes for the author of the best paper presented at its preceding annual meeting, for the junior or student presenting the best paper on a technical subject connected with pulp and paper industry, for the member who contributed the most valuable service to the section in 1951, and for the safest mill in Canada and gadget competitions, were presented January 24 at the annual business luncheon of the technical section, Canadian Pulp and Paper Association.

The I. H. Weldon Gold Medal, in commemoration of the late I. H. Weldon, one of the founders and second president of the association, was presented by its donor, A. L. Dawe, vice-president and general manager, Consolidated Paper Sales Ltd., Montreal, to the author of the best paper presented at the 1951 technical section annual meeting. The winner of the award was Dr. G. L. Larocque, New York Daily News, New York, N. Y., for his paper on measuring the printing quality of newsprint.

The Technical Section Service Award, a bronze medal and citation given to the section member who contributed most toward the furtherance of the aims and objectives of the technical section in the past year was presented by the donor, R. L. Weldon, president, Bathurst Power and Paper Co., Montreal, to J. C. Benny, technical control superintendent, pulp and paper division, Diamond Match Co., Ogdensburg, N. Y., who has been chairman of the section's sulphite committee for the past two years. Under Mr. Benny's chairmanship, the committee last year issued a report on methods of conserving sulphur in pulp and paper operations which was considered to be a major contribution to the industry's conservation program.

H. C. Lee
Chairman, Technical Section

The C. Howard Smith Gold Medal, donated by Harold Crabtree, president, Canada Paper Co., Montreal, in honor of the late C. Howard Smith, fourth president of the association, is warded to the junior or student member of the section submitting the best paper during the year on a technical subject connected with the industry. Mr. Crabtree presented the medal to G. G. Sutaone, temporarily with the Canada Paper Co., Windsor Mills, Que., as a chemical engineer. Mr. Sutaone, who is from India and is studying Canadian pulp and paper making processes, prepared a paper on the analysis of the cooking liquor used in the manufacture of sulphate pulp.

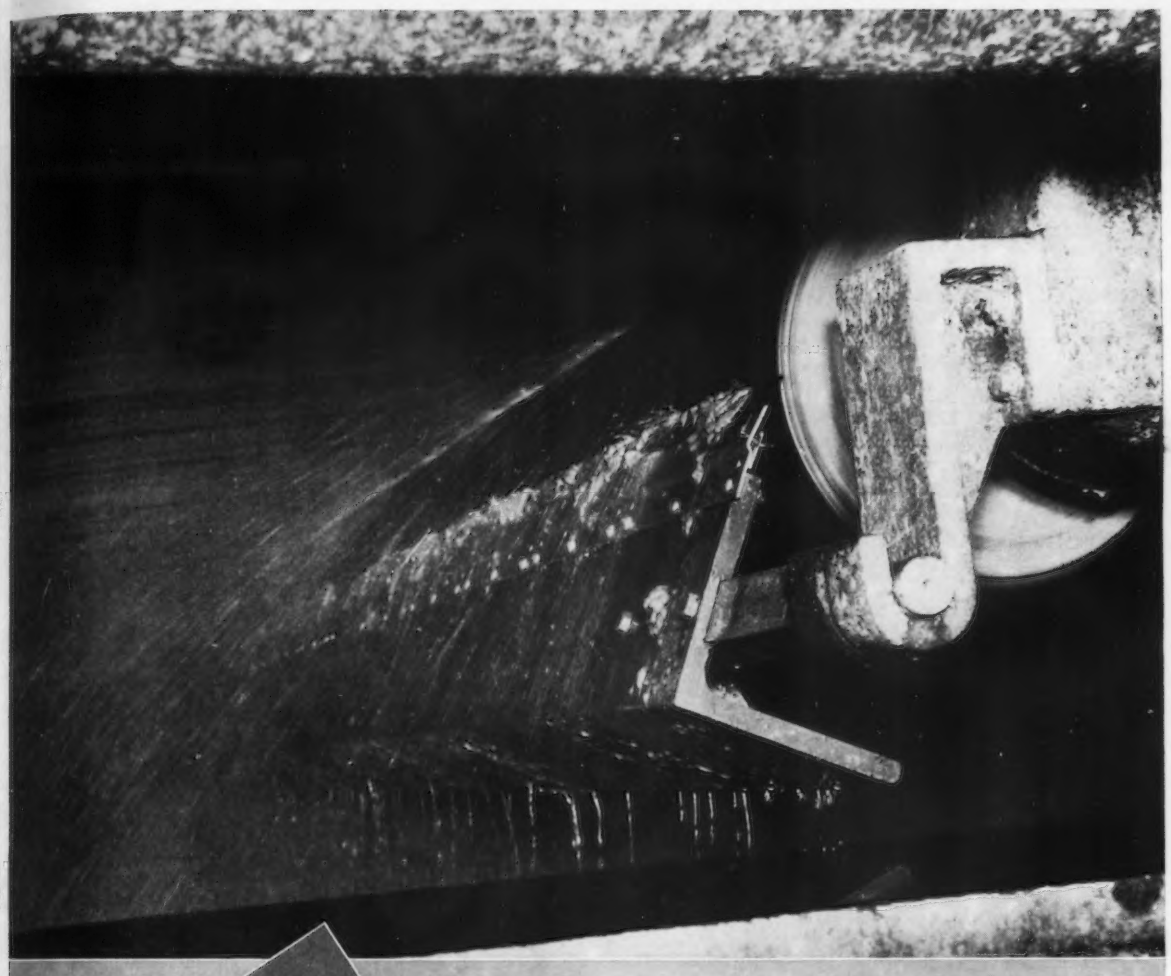
The Safest Mill in Canada contest is sponsored by the Pulp and Paper Magazine of Canada, which annually awards two shields to the pulp and paper mills in two classes which have the fewest accidents during the year in proportion to their operating time. J. N. Stephenson, the magazine's editor-in-chief, presented the shields to the two 1951 winners. Winner of class A for mills over 50,000 man-hours per month was the Grand'Mere, Que., mill of Consolidated Paper Corporation. The Barrett Co. Ltd., Joliette, Que., was the winner in class B for mills with under 50,000 man-hours per month.

Winner of the first prize of $50 in the gadget competition, sponsored by the Pulp and Paper Magazine of Canada and judged by the section's mill maintenance committee, was E. A. Shields, divisional engineer, Provincial Paper Ltd., Georgetown, Ont. Mr. Shields submitted a gadget for improved winding of finished rolls of paper, thus permitting an increase in machine speed. J. C. Cowie, assistant mechanical superintendent, Mersey Paper Co. Ltd., Liverpool, N. S., won the second prize of $25 for his device to prevent automatically paper from wrapping around the last dryer of the paper-making machine, should a break in the paper occur. The prizes were presented by R. C. Rowe, president, National Business Publications Ltd., Garvenvale, Que., publishers of the Pulp and Paper Magazine.

Paul E. Cooper
Chairman, Western Div.

Leander Manley
Secretary, Western Div.

C. H. Rimmer
New Chairman, Waste Committee



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Report of the Chairman of the Technical Section

At the annual business luncheon of the technical section, the chairman, W. W. Holland, manager of production, Oxford Paper Co., Rumford, Me., presented his report on the section's activities over the past year.

One of the two scientific societies of the association, the technical section in 1951 received 150 new members, its committees issued ten reports, and the membership in its branches increased sharply, said Mr. Holland.

There are now 1357 members of the section itself, and 3,000 in its branches. Through the section's summer and annual meetings and the regular branch meetings, mill personnel from coast to coast study and are informed of the latest technical developments in the industry.

The work of its various committees constitutes much of the real effort of the section, said Mr. Holland. Every phase of pulp and paper manufacture is continuously being studied and investigated by them. During the year they issued ten reports and at the close of the year they had thirty-two investigations in progress.

Last summer, Douglas Jones, the section's executive secretary, visited some 30 mills and research centers in nearly all the European countries producing pulp and paper. He met and discussed matters of mutual interest with officers of the technical associations in Great Britain, Norway, Sweden, Finland, Denmark, and France. And he saw several new developments and techniques of interest to the Canadian industry.

The technical section continued to work closely with the Pulp and Paper Research Institute of Canada, said Mr. Holland. Last fall the institute sponsored an international symposium on the fundamental chemistry of cellulose and lignin, the two main components of wood. The technical section assisted the institute in arranging this conference to which eminent scientists from many countries came and led learned discussions.

Mr. Holland concluded his report by expressing his appreciation to those persons who had supported and assisted the section during the past year in its efforts to increase the technical knowledge of the pulp and paper industry.

Summary of Activities of the Technical Section

Reviewing the activities of the technical section, Canadian Pulp and Paper Assn. in 1951, Douglas Jones, executive secretary of the section, Montreal, outlined the growth of membership, branch activity, extensive committee work, his inspection of mills and research centers in Europe last summer, and other activities of the section, one of the two scientific bodies under the aegis of the association.

With 1,357 members in the section itself, and with over 3,000 members in its ten branches across the land, a full cross-section of industry mill personnel is now represented in the section and receiving the benefits of its services, said Mr. Jones.

The principal activity of the section is concentrated in the work of its 17 standing committees. These had a full year and their investigations contributed in no small measure to the industry's technical progress. Their studies comprised a large number of matters, including electrical engineering methods, the handling of materials in the mills, instrumentation, improved pulping processes, fundamental research, the use of waste materials, and other subjects pertaining to pulp and paper manufacture.

The ten branches of the section continue to grow and held interesting and stimulating meetings for the benefit of their members, Mr. Jones continued. These branches located in pulp and paper centers from coast to coast provide the opportunity for mill personnel to study and keep abreast of industry technical matters.

Referring to a trip to Europe last summer, which he made on behalf of the technical section, Mr. Jones noted some of the observations he had made on the technical, research, and economic aspects of the mills he visited. In Sweden, he saw a new and outstanding development in the removal of bark from wood. In Germany, there was an interesting development in the roasting of pyrites, and in England he found new developments in papermaking machinery. Conservation is the keynote of European operations, he said. And in Finland and Sweden, sawmill, pulp and paper mill and chemical by-products plants are completely integrated in most instances. Fundamental and development research is also being extensively carried on.

In his review, Mr. Jones made special reference to the close cooperation of the section with the officials of the Pulp and Paper Research Institute of Canada, Montreal. Recognized as one of the world's leaders in its field, the Institute is expanding its activities and, he said, will continue to look to the technical section for technical advice and support in expediting the fruits of research developments.

Mr. Jones also reviewed the section's summer meeting, the numerous publications prepared and distributed to the membership, and the awards presented for outstanding contribution to the work of the section during the year.

Technical Section Executive Council

Chairman: H. C. Lee, assistant chief engineer, Canadian International Paper Co., Montreal, Que.

Vice-Chairman: R. L. Fraser, assistant to the manager of mills, Abitibi Power and Paper Co. Ltd., Toronto, Ont.

Councillors: Dr. W. Gallay, director of research, The E. B. Eddy Co., Hull, Que.; J. R. W. Grieve, superintendent, Brown Corp., La Tuque, Que.; J. B. Jones, assistant manager of manufacturing, The Ontario Paper Co. Ltd., Thorold, Ont.; T. R. Moore, mill manager, Anglo-Newfoundland Development Co. Ltd., Grand Falls, Nfld.; W. E. Soles, director and assistant general manager, Anglo-Canadian Pulp and Paper Mills Ltd., Quebec, Que.

Members of the executive council of the technical section are elected to serve on the council for three years. Messrs. Jones and Soles have just been elected to the council and will serve for the coming three years. They replace W. W. Holland, 1951 chairman and production manager, The Oxford Paper Co., Rumford, Me., and J. A. Hanna, assistant manager of operations, Bathurst Power and Paper Co., Bathurst, N. B., who are retiring after serving their three-year terms of office. Messrs. Lee, Moore, Fraser, Gallay, and Grieve served also on the 1951 council. The term of office for the first two men expires after this year and for the latter thre it runs until the end of 1953.

Report of Industrial Relations Section

In 1951, the industrial relations section increased its membership and broadened the scope of its activities, said the section's chairman, W. F. Cook, in his annual report.

Mr. Cook, who is director, industrial relations department, Kimberly-Clark Corp., Neenah, Wis., said that numerous reports and surveys on subjects relative to personnel administration were sent to members. Included was a data book containing much basic information on wages and other matters together with reports of the Dominion Bureau of Statistics on average earnings and hours at work. In addition, members also received wage rate and clerical surveys, summaries of mill practices regarding holidays, hours of work, overtime premiums, and other items, and reports of labor negotiations.

The section held its annual meeting in March in Montreal, and a conference in Toronto in October, Mr. Cook reported. These meetings were addressed by men outstanding in industrial relations and allied fields. Members also participated in group discussions on problems of mutual interest.

Paper Made From Glass

Paper made entirely from glass fibers has ben developed at the U. S. National Bureau of Standards, Washington, D. C. Commercially available fine glass fibres were mixed with water and formed into continuous sheets on a semicommercial paper-making machine to produce paper, with high resistance to heat, moisture, chemicals and micro-organisms.

PUTTING IT ON THE LINE...

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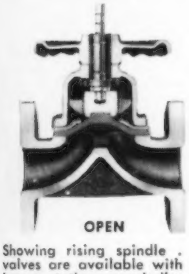
The Grinnell-Saunders Diaphragm Valve . . . . . .

Here's why . . . Piping in today's complex industrial plants is an exacting science involving the handling of highly corrosive fluids, gases, compressed air, beverages, foods and suspended solids . . . in lines where corrosion, abrasion, contamination, clogging, leakage and maintenance are costly factors. Under such conditions, the amazing adaptability of the Grinnell-Saunders Diaphragm Valve explains its acceptance by industry after industry.

Bodies of this versatile valve are made in a variety of metals — iron, stainless steel, bronze, aluminum and others. *But of more importance* is the fact that a body of cast iron (a metal not in short supply) can be lined with glass, lead, natural rubber, neoprene and other materials which, in many instances, handle corrosive fluids *better* than metals.

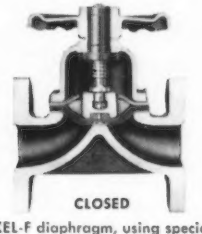
Diaphragms come in natural rubber, neoprene, butyl, hycar, a special synthetic for foods, and KEL-F. This last is chemically inert to all acids and alkalies in all concentrations with the exception of molten alkali metals.

From this broad selection of materials, the problems which the Grinnell-Saunders valve can solve are extremely varied. No wonder industry after industry is putting it on the line.



OPEN

Showing rising spindle . . . valves are available with rising or stationary spindle.



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KEL-F diaphragm, using special rubber backing cushion and floating tube nut design.

CHECK THESE GRINNELL-SAUNDERS FEATURES...

- Diaphragm absolutely isolates working parts from the fluid.
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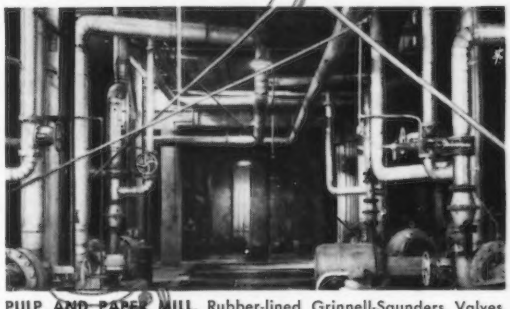
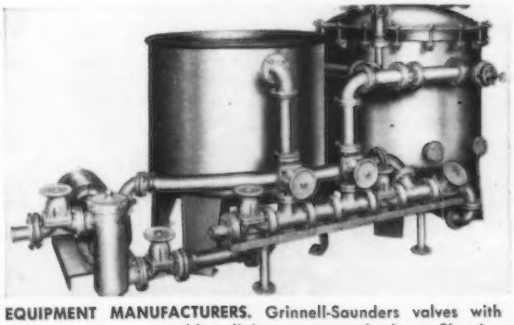


PULP AND PAPER MILL. Rubber-lined Grinnell-Saunders Valves on stainless steel piping handle sulphate pulp stock in bleach plant of Potlatch Forests, Inc., Lewiston, Idaho.

CHEMICAL PLANTS. Glass-lined Grinnell-Saunders Diaphragm Valves, with KEL-F diaphragms, handle chlorinated organic chemicals at Hooker Electrochemical Company, Niagara Falls, N. Y.



EQUIPMENT MANUFACTURERS. Grinnell-Saunders valves with rubber linings are standard on filtration equipment for solution clarification, made by Industrial Filter & Pump Mfg. Co., Chicago, Ill.

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Abstracts of Papers Presented Before The Technical Section of CPPA

APPLICATION OF THE DECULATOR TO FOURDRINIER PAPER MACHINES

J. A. Smith
Vice-President, Rotareaed of Canada, Ltd.

Results obtained to date from existing Deculator installations indicate that air-free stock will behave differntly in the headbox and on the wire from undeaerated stock. In general, there will be no foam, less slime, and fewer lumps and flocs in the headbox, and a higher wet strength on the wire with higher couch vacuums. A smoother and less porous finished sheet will be made. On newsprint machines it is reasonable to expect that at the same machine speed a reduction can be made in per cent sulphite without increasing the number of wet end breaks, or that alternatively the machine can be speeded up at the same per cent sulphite. The degree of improvemnt on any machine will depend on the specific machine and its limitations.

PULP STUDIES USING THE WET WEB TENSILE STRENGTH TESTER

E. Langins
Bowater's Newfoundland Pulp and Paper Mills Ltd.

Moisture and basis-weight curves have been prepared and standard conditions selected to permit the use of the Brecht initial wet strength tester for pulp studies. The effect of such variables as the age and the temperature of the stock was studied and the precision of the test method determined.

Comparison with the results of dry strength tests showed that the wet tensile strength gives more useful information about the paper web strength than dry tests. It was compared with the rate of breaking at the couch. The relationship was found to be more apparent with a modern high speed machine than with slower machines.

The effect on wet strength of adding sulphites of various chlorine numbers, broke stock, and Hawg refiner stock to groundwood was determined. The influence of beating is discussed.

The wet tensile strengths of pulps containing various percentages of different types of long fibres and fines were determined. The proportion of longs and fines giving the maximum wet tensile strengths were determined and the quality of the different types of longs and fines is discussed from the point of view of the paper maker.

WATERMARKING (SYNOPSIS) MONTREAL, JANUARY 23, 1952
Canadian Pulp and Paper Association Technical Section

Walter G. Hendrich
Hammermill Paper Co., Erie, Pa.

Type of W/M Equipment	Hand Mold	Marking Roll Dandy	Felt Marking	Molette or Rubber Mark	Metal Roll Marking on Dryer	Embossing Calender
Approximate Year of Invention	1230 to 1283	1820	1880	1900	1900	1900
Materials used in W/M design (light marks)	Copper, Brass, Stainless, Monel	Halfround, Oval-flat, Round wire, Sewed—soldered	Textile Thread Tightly Twisted Interwoven into wet felt	Solid Rubber Lettering or Design Mounted on Metal wheel	Bronze—Steel—Aluminum Lettering or Design Relief Engraving on Metal Wheel or Roll	
	40 to 80 mesh Mold wire	To or 30 to 65 mesh Dandy cover				
(Shaded Mark)	Embossed					
(Dark Mark)	Mold wire	or Dandy cover				
W/M Device & Design	Hand Mold Cylinder Mold	Trunnion Dandy Driven Dandy	Driven Pressfelt	Driven by Friction		Driven design roll
Consistency of stock while watermarking	0.5% to 1.2%	5.0% to 10%	15% to 30%	15% to 35%	25% to 50%	85% to 90%
W/M is formed by	Casting of stock	Displacement of Fiber & Slight Rupture of Paper & Compression of Paper				
While matermarking	Large amount of white w. drainage through mold wire	Drainage through Fourdrinier	Small amount of white w. drainage through marking felt	No drainage but extreme water displacement		Moisture displacement
Water Removal necessary after marking	85%	80%	75%	75%	50 to 40%	6 to 10%
A. by:	Pressing between felts	Pressing between felt and stone or metal rolls				
and B. by:	Air drying	Drying between heated dryers and felt under tension				Evaporation Heat of Calender
Essential stock Preparation	Medium Slowness & Short Fiber for light & shaded w/m	Free Stock & Short Fiber for light w/m also prevents crushed shaded w/m	Medium Slowness and Well bonding or felting fiber prevents rupture	Medium Slowness for Good Formation	Well Bonded, Good Formation	Well Bonded, Good Formation, Uniform Thickness & Moisture
Shaded Marks or Dark Marks:	Surface Texture Effects very visible					
Light Marks:	Visible on surface in extreme thickness or substance weight variations	Surface effects mostly in light weights and slow stocks	Surface effects outstanding usually desired	Surface effects mostly in heavy weights and free stocks	Surface effects quite visible embossed	Very visible embossed
Surface Sizing: & Air Drying:	Make marks more prominent on surface, particularly in light weight papers					

A SUGGESTED METHOD FOR THE ROUTINE DETERMINATION OF NEWSPRINT PRINTABILITY

Alex Glassman

Assistant Superintendent,
Technical Service Department,
St. Lawrence Paper Mills Co., Ltd.

This paper outlines a suggested method for routine printability control. It is intended to satisfy:

(1) The need for rapid machine-room control so paper makers can know what effect on printability operating changes make on the printed sheet.

(2) The need for quantitative expression of printability in a manner comprehensible to machine-room operators and management, and useful as a permanent technical characteristic.

Practical examples are given of the use of printability control in machine-room operation.

Details of technique and equipment are outlined together with a discussion of difficulties encountered.

SOME DATA IN THE OXIDATION OF BLACK LIQUOR

K. G. Trobeck

Aktiebolaget BT-Metoder, Kungsklippan 7,
Stockholm, Sweden

An investigation of sulphur losses in a sulphite mill, carried out with Hilding Bergström in Sweden in 1939, showed that high sulphur losses occur when black liquor is concentrated in a multiple-effect evaporator. Investigations at several sulphate mills indicate a loss of sulphur during evaporation of the liquor amounting to 24.6 to 31.0 lb. per short ton of pulp. As a result of this finding, we sought means to reduce this sulphur loss, and found that if the liquor was oxidized before concentrating, the losses during the subsequent concentration were greatly reduced (1). If the sulphide in the liquor is completely oxidized and the liquor then concentrated to 50 or 60 per cent solids, no sulphur is lost as hydrogen sulphide or mercaptans during this evaporation.

Early in 1941 an oxidation plant was set up at the Deje sulphate mill in Sweden. However, this plant could not be operated at full capacity due to then-unsolved foaming problems. In November, 1942, an oxidation plant of improved design was put into operation at the sulphate mill at Norrsundet, Sweden. This oxidizing equipment, which had a capacity sufficient for an annual output of 20,000 long tons of pulp, has now been in operation for more than eight years.

In 1947 another oxidation tower was added, and since July 1, 1947, the entire mill has been operated with oxidized liquor. In July, 1950, an oxidation plant was put into operation at the Ostrand kraft mill, its capacity being sufficient for an output of from 300 to 350 long tons of pulp per day.

ANALYSIS OF SULPHATE BLACK LIQUOR

A Rapid Method for the Determination of Carbon and Sulphur

G. G. Sutaone

Canada Paper Co.

The Parr peroxide bomb has been found to be useful for the rapid determination of total carbon and total sulphur in sulphate black liquor, if the modified procedure for ignition and fusion as recommended in this article is followed. The dried black-liquor sample is fused with sodium peroxide when all the carbon is converted to sodium carbonate and the sulphur to sodium sulphate. The fused mass is dissolved in distilled water. The carbon is determined as sodium carbonate by potentiometric titration with hydrochloric acid using a pH meter and the sulphur is determined, by the standard gravimetric method, as barium sulphate. The accuracy of the method has been checked by determining carbon in pure sulphosalicylic acid. The method has been shown to be sufficiently accurate and reproducible for routine control and mill investigation work.

FLASH DRYING OF LIME-KILN FEED

Henry Vranian

Chesapeake Corp. of Virginia

Robert D. Nickerson

Combustion Enginering—Superheater, Inc.

Flash drying of calcium carbonate lime-kiln sludge is used for the first time to supplement the capacity of an existing rotary kiln in a pulp mill.

The carbonate product is delivered from the dryer to the kiln at a controlled moisture content. Most of the former drying zone in the kiln is now available for calcining, resulting in increased lime-burning capacity.

The heat for the dryer is drawn from the plenum chamber of the lime-kiln stack. Under the present conditions the dryer does not use all the available heat and some is by-passed to the stack.

As a result of drying, the lime-burning capacity has increased by 40 per cent, fuel consumption reduced by 38 per cent, and make-up lime reduced by 37 per cent.

Use of a secondary dust collector is considered advisable and should reduce the make-up lime further.

THE REMOVAL OF DIRT FROM UNBLEACHED SULPHITE PULP

J. Foster

Gaspesia Sulphite Co., Ltd.

When making unbleached sulphite pulp from small, knotty wood, the pulp from the digesters will contain fine specky dirt which is very difficult to remove. The various screening methods for doing this are critically reviewed and compared and a theory of rotary screening is presented. It is shown that only a proportion of these fine specks can be removed in any one screening operation.

To thoroughly clean such wood is economically impossible. Therefore, to make clean unbleached sulphite, it is necessary to start with clean wood. However, the methods by which the greatest amount of these specks can be removed are described.

EXPERIMENTAL COOKING OF HIGH YIELD SULPHITE PULP

W. H. Bush, O. J. Walker and K. C. Logan

Northeastern Paper Products Ltd., Que.

The influence of cooking variables on the yield of spruce sulphite pulp was studied in the high yield range. It was found that the transition from a pulp to a relatively hard chip was sharp and occurred at a permanganate number of approximately 30. The highest screened yield obtained was 54% with an additional 4% rejects using an eight and one-half hour cook, an acid of 10.5% total SO_2 and 110 pounds pressure at a maximum temperature of 120°C. However, almost as high screened yields wer obtained with other acids, temperatures and pressures. It was concluded that the uniformity rather than the particular set of pulp-conditions was more important in determining the maximum. The total yield appeared to depend mainly on the permanganate number. From analyses made during the progress of the cooks the equilibrium concentrations of sulphur dioxide at different temperatures and pressures were calculated and presented graphically.

LAP AND SHEET PULP HANDLING IN PULP AND PAPER MILLS

A report prepared by the Materials Handling Committee of the Technical Section, C.P.P.A.

The reports of this Committee are case histories of improved methods of handling for common basic operations. There are many operations which are

common to every type of mill in spite of the variation in mill layout, hence it was decided to supply yardsticks which can be used for comparison. It is obvious that the only means by which the efficiency of one method can be compared with another is its unit cost. The unit cost, however, is expressed in man-hours and truck- or equipment hours.

This report cannot hold the interest of the mill superintendent who has one or two standby wet machines, but will be of use to the superintendents of pulp and paper mills handling more than fifty a.d. tons of lapped pulp per day. As is found in all mass production, the most efficient methods of handling are to be obtained where the quantity is sufficient to *fully utilize* mechanical man-savers.

Three objects were sought by the Committee in its study:—

1. To study each phase of the project with a view to making recommendations to the industry for improvements.

2. To present to the industry detailed descriptions of improved methods actually in use in the industry which have proven themselves in practice.

3. To invite comments from representatives of mills not described, with the object of collecting further data.

Each phase of handling was studied and the case history of a good installation for taking care of each phase is described below:—

1. Removal of laps (includes sheets unless otherwise noted) from pulp-making machines in the pulp mill. Dry pulp is stacked by layboy at Harmac. However, even Kamyr sheets (60 per cent a.d.) are still all hand-stacked. Experiments on a layboy are in progress at a Southern Ontario mill and results will be reported later.

2. Transport from machine—
   (a) to common carrier, either via storage or direct.
   (b) through bailing process to common carrier.
   (c) direct to pulper room of paper mill.

3. Transport between pulp mill and paper mill other than by common carrier.

4. Pulp storage.

5. Charging of pulpers and beaters.

THE EFFECT OF WOOD HANDLING AND CHIP PREPARATION ON SULPHITE PULP YIELD AND QUALITY

W. F. McKee

Control Superintendent,
Abitibi Power & Paper Co., Ltd.,
Smooth Rock Fibre Division.

Many articles have been written on the effect of wood handling and chip preparation on the yield and quality of sulphite pulp. This paper summarizes experimental work performed by one mill in order to determine to what extent the quality and yield of their product could be improved by improving their methods of wood preparation and chip production.

The article concludes with a brief review of literature on this subject.

Newsprint Panel

Left to Right—G. C. Boone, W. R. Keating, Gordon Sutton, J. N Franklin and E. L. Neal.

TEARING STRENGTH AND ITS RELATIONSHIP TO BASIS WEIGHT

H. W. Jones

Research Chemist and W. Gallay,
Director of Research,
the E. B. Eddy Co., Hull, Que.

The degree of strength of paper manufactured by Canadian pulp and paper mills is constantly tested to ensure that the final product will meet certain specifications and will not tear when it is used for printing, wrapping or other purposes. Investigations into the testing technique for determining the tearing quality of fine papers were described by Dr. W. Gallay, director of research and H. W. Jones, research chemist, the E. B. Eddy Co., Hull, Que.

Resistance to tearing is one of the most important of the physical characteristics of paper and indeed in some grades may be the predominant strength factor involved, they said. The tearing strength in most mills is determined on a standard instrument following a standard procedure, and the results are expressed in terms of unit basis weight,—i.e. the force required divided by the weight of the number of sheets being torn. This implies that the tear factor of paper is a characteristic of the pulp used in making it, assuming uniformity in the manufacture of the paper, and is hence independent of the weight of the paper.

However, from their investigations, they found that there is marked dependency of the tear factor on the basis weight in the testing procedure. This relationship, they said, must be taken into account in establishing tear specifications for different uses of paper in any one grade.

RECOVERY OF SULFUR DIOXIDE FROM DILUTE GASES

H. F. Johnstone

Professor of Chemical Engineering
University of Illinois
Urbana, Ill.

The prevailing shortage of sulfur resulting from the greatly increased demand and diminishing resources in the United States has brought about a reconsideration of methods for the recovery of sulfur dioxide. The situation is particularly serious in the paper industry, where the mills are often located in areas distant from smelters and the other sources of concentrated waste gases. Conservation of sulfur is necessary and every effort must be made to prevent waste. This situation is likely to exist for several years, since the resources of sulfur in Texas and Louisiana will be unable to supply the increased demand. Recovery of hydrogen sulfide from refinery and natural gases will help to alleviate the condition, but it is unlikely that this source will ever supply more than 10 percent of the sulfur consumed in the two countries. The sulfur shortage will undoubtedly be made up by in-

Alkaline Pulping Panel

Left to Right—Walter Houghton, D. M. Reed, Dr. J. H. Ross, Claude Steeves, L. Tomlinson, E. G. Wilson.

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THROUGH THE HEART OF THE SOUTH

creased use of pyrites with heavy exportations from Canada into the United States. Rich smelter gases will be tapped for sulfur dioxide for acid production in increasing quantities. In fact, we may look to the time when much of the acid produced will come from by-product gases and brimstone will be used only where elemental sulfur is required for processing. Nearly 80 percent of the sulfur now consumed passes through the sulfur dioxide stage where it is used as such or is further oxidized to sulfuric acid. As recovery processes are improved, each industrial area will be provided with a source of sulfur dioxide and liquefaction and transportation costs will not be so important as they now are. It is unlikely that elemental sulfur will be produced in quantity by reduction of sulfur dioxide because of the cost of the reducing agent and the expensive process that is involved. Furthermore, liquid sulfur dioxide cannot be transported economically over long distances. Industries that require the gas will look to their immediate neighborhood for sources. Many will find it economical to recover it from stack gases from the combustion of high sulfur coal burned in their own power plants. Katz points out that the amount of sulfur emitted to the atmosphere as sulfur dioxide greatly exceeds the total quantity that is consumed, and the sulfur in stack gases from power plants exceeds that in all other forms of waste gases (35 million tons per year). It is unlikely that a large portion of this sulfur dioxide can be recovered because much of it results from the combustion of low sulfur coal, but an increasing percentage of the coal used contains more than 4 percent sulfur; that used in some of the paper mills in Canada contains as much as 8 percent. With modern methods of combustion the stack gases from these fuels contain 0.5 percent SO_2 and more, and recovery can be accomplished easily and economically.

A PRACTICAL APPROACH TO STOCK PREPARATION FOR PAPER AND BOARD

Howard W. Hyman
Alexander Fleck, Ltd.
and
Howard P. Espenmiller
Black-Clawson, Shartle, Dilts Laboratories

This paper provides a moderately comprehensive outline of stock preparation presented in a practical yet reasonably fundamental manner. It represents an attempt to provide, in one article, a pattern or guide for the study of stock preparation and the development of improved stock preparation systems. The subject is treated under the following headings:

The Cellulose Fibre; The Sheet of Paper; The Basic Equipment; Intimacy, the Controlled Factor; The Intimacy Factor; Stock Freeness; Consistency; Other Stock Conditions; Chemical Additions; Equipment Fillings; Power Consumption; Process Balance; Types of Systems; Selective Treatment of Fibre; Bar Patterns and Thicknesses; Broke Disposal; Groundwood Pulp; Process Control; Summary.

Technical Section Luncheon

Left to Right—R. L. Weldon, Bathurst Power & Paper Co., Ltd., Bathurst, N. B.; D. W. Ambridge, Abitibi Power & Paper Co., Ltd., Toronto, Ont.; W. W. Holland, Oxford Paper Co., Rumford, Me.; R. M. Fowler, C.P.P.A., Montreal, Que.; H. C. Lee, Canadian International Paper Co., Montreal, Que.; A. L. Dawe, Consolidated Paper Sales, Ltd., Montreal, Que.

THE IMPORTANCE OF RECOVERING SULPHUR FROM INDUSTRIAL POWER PLANT FLUE GASES IN VIEW OF A WORLD SULPHUR SHORTAGE

E. R. Mitchell
Engineer, Division of Fuels, Mines Branch, Ottawa

We have heard and read much about a world sulphur shortage in recent months and we have probably asked ourselves how and why such a situation has arisen. The answer is simply that the world is dependent on the United States for 90 percent of its native sulphur supplies and production cannot keep pace with the demand. The dependence on the United States grew rapidly with the introduction of the Frasch process for producing brimstone which made huge quantities of low cost sulphur available. The world demand for sulphur rose greatly between 1900 and 1949 particularly following the first World War and it now appears that United States deposits are dwindling. The world sulphur shortage implies that production from present sources cannot meet the demand and that other known sources must be developed.

We may also ask how serious a so-called sulphur shortage is to us in Canada.

In 1949, Canadian industry consumed 506,700 tons of sulphur. Of this, 327,800 tons were imported from the United States and only 178,900 tons were derived from domestic sources. The pulp and paper industry consumed 252,500 tons of the 327,800 tons imported and the requirement this year may rise to 300,000 tons. The pulp and paper industry is, by far, our largest consumer of sulphur. The seriousness of a reduction of imports, at this time, lies in the fact that in world trade pulp and paper are Canada's main commodities, usually greater than wheat and far greater than nickel.

Technical Section Council

Left to Right—T. R. Moore; W. E. Soles; J. B. Jones; H. C. Lee; Dr. W. W. Gallay; J. R. W. Grieve; R. L. Fraser; Douglas Jones.

Over a considerable period, newsprint alone has brought Canada more export dollars than any other single commodity. Furthermore, pulp and paper manufacturing operations as far as the basic paper making stage, employed 52,050 people in 1949 and paid $157,703,868 in salaries and wages.

A sulphur shortage then, would strike one of our leading manufacturing industries, one that is by far the largest sulphur consumer and one that is Canada's leading export dollar earner.

The vulnerability of the pulp and paper industry cannot be disputed at the moment even though the United States has been extremely generous in meeting our continued demand for sulphur. The immediate future is obscure and of considerable concern.

Fortunately, Canada is richly endowed with sources of sulphur but we lack sufficient treatment plants to be adequately self supporting. These sources include pyrrhotite tailings from the Kimberly lead-zinc concentrator in British Columbia where over 3000 tons a day of pyrrhotite tailings are produced and several million tons are available from previous years' operation. A second source is from the natural gas fields of Western Canada. A third is from the bituminous sands of Alberta where a 20,000 barrel a day treatment plant could supply all of Western Canada's sulphur requirement. A fourth is from pyrite deposits in Western Quebec and in the Eastern Townships of Quebec. A fifth is that presently being recovered from smelter gases at Trail, B. C., and Sudbury, Ontario. A sixth source of sulphur, which is now attracting considerable attention, is in industrial power plant flue gases in the form of sulphur dioxide.

THE FILTRATION OF BOILER FEED-WATER USING DIATOMACEOUS EARTH

Thos. H. Norris

Mill Chemist, Iroquois Falls Div.,
Abitibi Power & Paper Co. Ltd.

This paper is divided into six main sections:

1. A short general discussion on filtration.

2. An explanation of diatomaceous earth—its structure, characteristics and uses.

3. An outline of the structure of the diatomaceous-earth pressure-leaf-type filter in use at Iroquois Falls and auxiliary equipment required.

4. Oil removal from contaminated condensate.

5. Clarification of boiler make-up water.

6. Miscellaneous uses of this filter and diatomaceous earth in other industries.

A DISCUSSION ON GROUNDWOOD THICKENING METHODS AND EQUIPMENT

E. P. Walsh

Assistant Control Superintendent,
Anglo-Newfoundland Development Co. Ltd.

The groundwood thickening processes for various newsprint mills are described and differences in operating procedure noted. An attempt has been made to point out the advantages and disadvantages of each system and to arrive at some standard level of comparison.

The capacity, operating performance, maintenance cost, and other pertinent data for numerous types of pulp thickeners are recorded, and discussed at length. From this it would appear, that in general, the couch-roll type of thickener, whether it be a vacuum filter or a simple decker, is the most efficient thickening equipment. Maintenance costs listed are not sufficient for true comparison purposes.

MODERN HIGH SPEED GRINDERS AT POWELL RIVER

S. A. Collicutt

Superintendent of Technical Services and

J. A. Cochrane

Chemical Engineer

The paper machines at Powell River are now averaging over 1000 tons of newsprint each day. Groundwood for this tonnage is produced on 58 three-pocket, hand-fed grinders. These grinders are equipped with stones 54 in. diam. by 35 in. wide and grind blocks 32 in. long, sawn with cross-sections averaging about 40 sq. in.

Production is to be increased by 120 tons within the next 12 months and additional groundwood capacity to the extent of 120 tons per day will be required. In line with a long-range modernization program, it is planned to produce this increment groundwood tonnage with modern super grinders. The experience with these grinders will provide information which can be applied to plans for gradual replacement of the existing grinders. It is noted that, although large modern type grinders such as the Roberts, Waterous magazine, Waterous-Great Northern and Continuous caterpillar grinder are used successfully on Eastern roundwood, experience with such grinders on West Coast sawn wood is very limited.

Wood on the Pacific Coast is salt-water borne to the mills in the form of logs ranging in length from 8 ft. to 80 ft. and in diameter, from 5 in. to 60 in., the average being 40 ft. long and 17-in. diameter. At Powell River these logs are cross-cut in lengths of twenty feet and hydraulically barked with high pressure nozzles. The barked logs for groundwood are then sawn longitudinally into slabs 6 in. to 8 in. wide. The cants are cross-cut by circular slasher saws into 32-in. lengths and fed to an automatic block loader which piles the blocks into ricks or skips, approximately fifty blocks to a skip. The converting loss from logs to blocks is approximately 9 per cent the wood volume in the logs. The skips are picked up by gasoline lift trucks and transported to the grinders. Blocks are hand-fed to the grinders, one man to two grinders, each grinder producing 14 O.D. tons per day of screened groundwood.

General requirements for a modern grinder in our operations are as follows:—

1. Magazine or pocket design must be such that sawn wood, predominantly rectangular in shape, will feed satisfactorily without jamming to any serious extent.

2. General design is to be based on a block length of 64 in. Also, during the change-over the grinder must be suitable for charging with two 32-in. blocks end to end (to give 64 in.). Wood preparing operations cannot be economically arranged to permit cutting 64-in. lengths together with 32-in. lengths.

3. The design must be such that the grinder will satisfactorily handle blocks with cross sections at least 12 in. by 12 in. The larger sections are desirable to reduce wood conversion losses occasioned by sawing.

4. Charging of grinders must be at least semi-automatic and must entail no lifting of blocks. Blocks 64 in. by 12 in. by 12 in. will weigh in excess of 300 pounds.

5. Power requirements should not exceed the present 60-65 h.p.-days per O.D. ton at 85-95 screened pulp freeness, Canadian Standard.

6. Materials in the grinder, which are in contact with pit pulp, must be resistant to corrosion in a system using zinc hydrosulphite for brightening. Present grinders are constructed of chrome steel where corrosion is prevalent.

7. The artificial stone for the grinders must be designed to a 67-in. width and 69-in. diameter and be capable of withstanding, without breakage or loss of segments, conditions whereby 4500 h.p. will be developed at 273 r.pm.

With these requirements in mind, certain experimental investigations were carried out to provide data with which to decide on the type and design of grinders to be installed for the immediate increase of 120 tons.

APPARENT VISCOSITY AND ITS RELATION TO CONSISTENCY REGULATION

R. Murley

Chemical Engineer,
Bowater's Newfoundland Pulp and Paper
Mills, Ltd., Corner Brook, Nfld.

In Canadian pulp and paper mills, various pulp mixtures are prepared for

different types of pulp and papers to be produced. In the preparation of a pulp mixture or stock, various pulps and other materials with different consistencies are mixed together, and it is essential that the resulting pulp stock be of uniform consistency to ensure a certain quality of the pulp and the paper which may be made from it.

Some aspects of automatically controlling the consistency of pulp stock were presented in a paper by R. Murley, chemical engineer, Bowater's Newfoundland Pulp and Paper Mills Ltd., Corner Brook, Nfld. For his paper Mr. Murley received honorable mention in the 1952 C. Howard Smith medal award competition sponsored by the Technical Section.

Manual control is impracticable for accurate consistency regulation since the operator cannot judge consistency within the limits necessary for satisfactory control. Frequent testing is also impracticable, as the tests cannot be performed quickly or accurately enough to enable the operator to adjust the amount of water in the stock. Therefore, some automatic consistency regulation or control is employed.

Mr. Murley described the principle of controlling consistency, which is based on the viscosity of the mixture, and he discussed the effects of certain variables, such as temperature and types of pulp on the operation of the consistency control mechanism.

WINDER DRIVES

L. W. Fisher

Industrial & Central Station Engineering, Canadian General Electric Co.

The function of the winder is to trim and slit the paper taken from the paper machine into the desired widths; allow removal of any poor quality sections of paper; provide an opportunity for splicing the paper when required; and, finally, wind the paper into uniformly hard, smooth-edged rolls which can be used in subsequent processes without loss of production due to poor quality paper or poorly wound rolls.

Basically winders can be divided into two main groups, depending on the type of brakes used for holding tension in the sheet.

1. Mechanical-tension winders where tension is held by means of a mechanical brake which may be manually adjusted or adjusted automatically through some mechanical linkage.

2. Regenerative tension winders which hold essentially constant tension automatically by means of a regulated braking generator driven by the unwind roll.

In addition to this classification, which pertains mainly to the type of brake used, an AIEE sub-committee (report published by TAPPI) have made up the following classification of winders with regard to winding speed, winder width, and weight of paper wound.

(1).

Speed

Low—Up to 1,000 f.p.m.
Medium—1,000 to 2,000 f.p.m.
High—Above 2,000 f.p.m.

Size

Narrow—Up to 75 in.
Medium—75 to 150 in.
Wide—Above 150 in.

Paper weight, based on a ream of 3000 sq. ft.

Light—Up to 35 lb.
Medium—35 to 150 lb.
Heavy—Above 150 lb.

This classification is of assistance in the selection of the type of drive most suitable for a given winder winding a given weight of paper. Borderline cases always exist in such a classification and this, along with such things as personal preference for a certain type of drive, the large number of types of drives available and economic considerations, makes the selection of a winder drive quite complex. Out of the large number of drives available five types have been selected.

TYPES OF DRIVES

I. Wound-Rotor-Motor Drive (Mechanical Tension)

This type of drive has been used quite extensively in the past, but is rapidly being replaced by the other types of drives because of their superior performance. Equipment required for this type of drive, in addition to the motor, is a primary starter, a RUN-STOP push-button, a drum controller, and a secondary resistor. Electrical interlocking permits the drive to be started only on the first point of the drum switch.

II. Wound-Rotor Commutator-Motor Drive (Mechanical Tension)

This type of drive is rapidly coming into the foreground for low to medium speed winders.

The complete drive consists of only three control units: an a-c wound rotor commutator motor; a primary control unit; and an operator's control station.

III. D.C. Adjustable-Voltage Drive with Rheostat Control

The adjustable-voltage drive has been used extensively in the industry for many years and can be applied to any type of winder, large or small, high speed or low speed. Variables rates of acceleration to top speed and deceleration to low speed can be obtained and may be as fast as the rating of the drive permits. The drive provides a soft start. It provides a low threading speed which is not affected to any great extent by normal load changes due to changes in back tension.

Two basic types of equipment can be offered to give the adjustable voltage control:

IV. D.C. Adjustable-Voltage Drive with Regulator

This drive is essentially the same as that previously described except a generator-voltage regulator is added. Various types of regulators are available. The General Electric Company finds the amplidyne ideal for this purpose but occasionally uses electronics. With this addition, speed regulation of the drive is improved, rates of acceleration and deceleration can be preset, and the operator is provided with a preset speed control.

Conclusion

The foregoing is by no means a complete coverage of all the types of drives available for two-drum winders. Such drives as slip-belt, mechanical, magnetic, and liquid clutch drives were not discussed. The most widely used types of electrical drives have, however, been described. Fundamentally a drive must provide a soft start, and smooth yet rapid acceleration and deceleration or stop. It should, as well, provide a suitable low jogging or threading speed and be adjustable in speed over the entire range between threading and top speed.

Where automatic tension control is required, the regenerative-tension braking scheme should be considered because of power savings, superior tension control and reduced maintenance costs.

THE PREPARATION AND COMPOSITION OF SOME CANADIAN CONIFEROUS OILS

A. C. Shaw

Department of Chemistry, Ontario Research Foundation, Toronto, Ont.

The possibilities of extracting and utilizing coniferous oils from logging slash, branches and foliage were discussed by A. C. Shaw, department of chemistry, Ontario Research Foundation, Toronto.

While considerable progress has been made in recnt years in the utilization of waste material from pulping and sawmill operations, the possibilities of converting logging slash, branches and foliage generally left in the forest after cutting operations, have not ben fully explored. This material comprises about 20 percent of the tree. For black spruce alone it is estimated that in Ontario there is an annual volume of waste foliage of about a quarter of a million tons yielding no economic return. Accumulation of slash and foliage are fire hazards and create disposal problems. Since this material is bulky and difficult to

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transport and it does not lend itself to the usual uses for wood, practical uses for it are not readily apparent.

It does, however, contain considerable quantities of essential oils which could be prepared if the problems of cheap methods of gathering and transporting it, increased yields of oil, utilization of he residue! extracted material, and new and wider markets for the oils could be solved.

Mr. Shaw described the Ontario Research Foundation's experiments with distilling slash and foliage, both in commercial and laboratory distilling equipment. The chemical composition of four oils of greatest commercial interest from a standpoint of yield and odour was established. Oils with good to excellent odours were obtained in acceptable yields from hemlock, black spruce, white cedar and balsam fir. The oils from these four species are of commercial value. All the oils contain bornyl acetate, but it appears in important amounts in spruce and hemlock only. They are a rich source of this material. The most valuable constituent of cedar oil is thujome.

BACK PRESSURE POWER AND THE STAL DOUBLE ROTATION TURBINE

H. A. Janson

Vice-President, Swedish General Electric, Ltd., Montreal, Que.

The use of steam for heat and power in pulp and paper mills and the operation of the stal double rotation turbine was discussed by H. A. Janson, vice-president, Swedish General Electric Ltd., Montreal.

Heat and electric power are used in all idustries, but their consumption varies considerably. Electric power generated in a steam power plant cannot ordinarily compete with hydro electric power on a cost basis, said Mr. Janson, but where it is possible to use both the heat and power from steam, steam power will in many instances be cheaper than water power.

Mr. Janson presented illustrations of the use of steam in a modern paper mill for producing power and heat required in the process. He discussed the cost of producing such power and described, with illustrations, the operation of his company's double rotation turbine.

ADEQUATE SWITCHING EQUIPMENT FOR POWER DISTRIBUTION IN PAPER MILLS

J. P. Skillen

Product Enginering Department, Apparatus Division, Canadian Westinghouse Co. Ltd., Hamilton, Ont.

Canada's pulp and paper industry uses over 33 per cent of all the power generated for industry in the nation. It requires this power to operate its grinders, giant paper-making machines, and other equipment used to convert the annual pulpwood harvest into nine million tons of pulp and paper each year.

Extensive equipment is required to carry and distribute the large loads of electrical power within pulp and paper mills. The need for adequate switching equipment to control the power was described by J. P. Skillen, Canadian Westinghouse Co. Ltd., Hamilton, Ont.

Referring to early designers' theories of distributing electrical currents, he outlined the development of switching equipment from the first type to that required by some of the complex electrical installations of today. And he also suggested possible future trends of design and use.

THE OPERATION AND MAINTENANCE OF GRINDER LOAD REGULATORS ON WATEROUS HYDRAULIC GRINDERS

Duncan Graham

Electrical Superintendent, Abitibi Power & Paper Co., Ltd., Thunder Bay Division, Port Arthur, Ont.

In the average newsprint mill of today around 80 per cent of the stock used in the manufacture of newsprint is groundwood stock and the power consumed is around 67 per cent of the total primary mill load. The other 33 per cent is used in wood preparation, screening, pumping, and paper-machine drives, etc. This load is fairly constant but the grinder load can be varied slightly without interfering with the quality of the stock. With 67 per cent of the total mill load, which can be slightly varied, and under control of a master governor, the maximum demand can be controlled at any desired figure. The master governor controls the individual grinder line governors to accomplish this purpose. The individual electric governor controls the motor load by varying the pressure on the pressure shoes to balance the load setting on its wattmeter control element. The control stands (one at each pocket) control the direction of movement of the pressure shoes and keep the non-grinding time to a minimum. The three units—master governor, individual governor and control stands—working together, maintain a maximum output with a minimum of power.

MICROBIOLOGICAL DEGRADATION OF LIGNICELLULOSE MATERIAL

D. W. Stranks

Ottawa Forest Products Laboratory, Department of Resources and Development

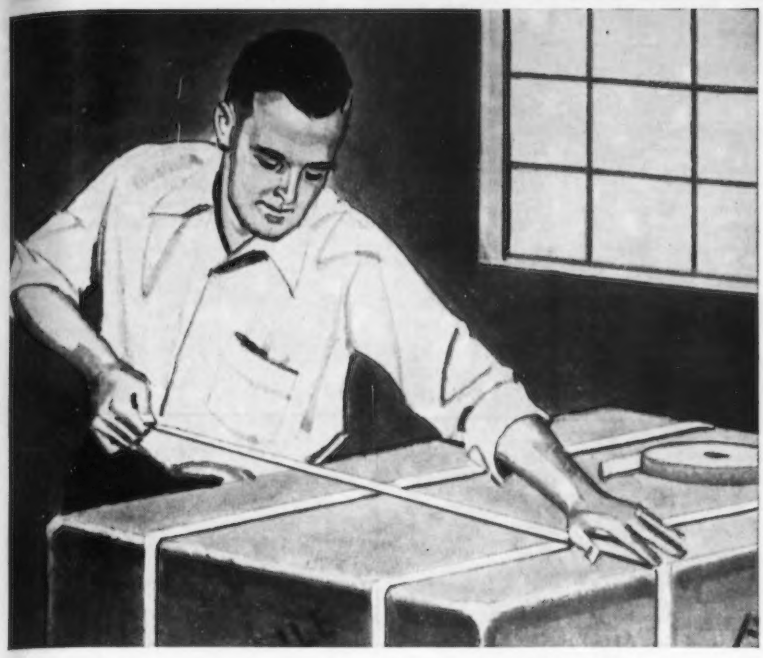
As yet only a small fraction of the finely divided wood waste that is available is used to the advantage of the producer. This paper deals with the possibility of utilizing such waste by fermentation. Most of the data presented comprises the fundamental research that has been done to date on this problem. Some limited experimental material is presented on the feasibility of using rumen organisms for the fermentation of wood waste, and the possible use of such waste as cattle fodder.

New Pulp Mill and Hydro Electric Plant for B. C.

Western Plywood Co. Ltd. will build a $20 million pulp mill in the Quesnel area. This will take place within the next four or five years. It is expected that the new plant will be able to produce 200 tons of bleached sulphate daily. Waste wood from the plywood industry and salvageable timber from the woods will be utilized and further integrate the Western Plywood Co. Ltd., which is the aim of all such companies in B. C. today. Western Plywoods has a $1,500,000 plywood plant which was erected in 1945.

Power which will be needed by this new company will be supplied by a power plant that will be constructed by the B. C. Power Commission on the north fork of the Quesnel River. Salmon interests have opposed most sites chosen thus far for such power plants but it is expected that they will not interfere here. The first stage of the power plant is expected to cost around $10 million. When it is completed it is expected to have 150,000 horsepower.

Some 200 employes will be needed for the pulp plant and many hundreds more will find employment in the woods and the power plant. The whole Quesnel area, in the central interior of B. C., should prosper and benefit by this expansion.



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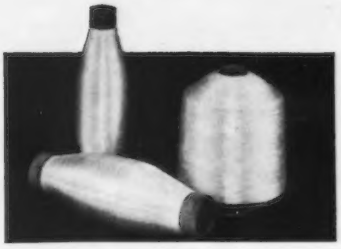

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Wh. No. 1 MG	2.25 / 2.40
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Wh. No. 2	1.75 / 2.00
Kraft Anti-Tar 20x30	2.12 / 2.25
White Anti-Tar 20x30	2.20 / —

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Unbleached 4½x5, 650 sheets	6.65/ —
Bleached 4½x4½	10.00/12.50
Bleached 4½x5	9.96/ —
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	*U. S.	Canadian	*Swedish	*Finnish	*Norwegian
Groundwood	$92.50/ —	‡$95.00/100.00			
Sulfate, Bleached	145.90/ —	190.00/200.00	$230.00/ —	$230.00/ —	$230.00/ —
Semi-bleached Sulfate	140.00/ —				
Sulfate, Unbl.	132.50/ —	145.00/175.00	200.00/ —	200.00/ —	
Sulfite, Blchd.	140.00/ —	160.00/175.00	225.00/ —	225.00/ —	225.00/ —
Sulfite, Unblchd.	132.50/ —	150.00/160.00	200.00/ —	200.00/ —	
Sulfite, Unbl'd (Glassine)		164.00/ —			
Soda, Blchd.	140.00/ —	155.00/160.00			
Sulfite Screenings	72.50/ —				
Sulfate Screenings	67.50/ —				
Groundwod Screenings	60.00/ —				
Unblchd Sulfate Sideruns	132.50/ —				
Stand. News. Sideruns	92.50/ —	106.00 —			

* OPS Ceiling, CPR 49 ‡ F.o.b. Shipping Point.

Boards Delivered plant, per ton ..... CPR 108

Filled News	$110.00/ —
Plain Chip	105.00/ —
Blchd. Mla. L-d. Chip	150.00/ —
White Pat. coated .020	175.00/ —
Kraft Liners 42 lb. per M sq. ft.	2.47/ —
Kraft Corr. .009 per M sq. ft.	1.59/ —
Binders Boards	137.50/140.00

The following prices are representative distributors' resale prices:

Rag Content Bonds and Ledgers—
White, 20 lb.

Bonds	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$70.45/$75.90
100% Rag	62.65/ —
75% Rag	48.15/ —
50% Rag	38.90/ —
25% Rag	31.65/ 33.00

Ledgers	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$72.65/$72.80
100% Rag	63.90/ —
75% Rag	49.40/ —
50% Rag	40.20/ —
25% Rag	33.00/ 34.30

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds	4 Ctns.
	per cwt.
Watermarked	$19.00/$20.50
Plain	18.40/ 19.50

Ledgers	4 Ctns.
	per cwt.
Watermarked	$20.30/$21.80
Plain	19.35/ 20.80

White Book

Conversion Coated	Case
	per cwt.
No. 1	$23.90/$24.65
No. 2	22.15/ 23.40
No. 3	21.90/ 22.40
Machine Coated	
No. 1	$18.40/$18.90
No. 2	16.65/ 16.90
Uncoated	
No. 1 Antique (Watermarked)	$18.65/$19.65
Offset	18.65/ 19.90
A Grade E. F.	18.10/ 19.90
A Grade S. C.	18.65/ 19.40
B Grade E. F.	18.40/ —
B Grade S. C.	17.40/ 19.15

‡ Indicates a price change.

WASTE PAPER MARKET

Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) These quotations are a partial indication of the price range in each market on the date specified, as gathered from major dealers. ALL PRICES ARE STRICTLY NOMINAL.

	New York Jan. 22	Philadelphia Jan. 22	Boston Jan. 24	Chicago Jan. 7
No. 1 Mixed Paper	nominal	$10.00/ 11.00	$10.00/ —	$10.00/ —
No. 1 News	12.00/ 14.00	12.00/ 13.00	12.00/ 13.00	17.00/ —
Over-issue News	15.00/ 18.00	14.00/ 18.00	15.00/ 22.00	20.00/ —
Mill Wrappers	13.00/ 22.00	13.00/ —	13.00/ 19.00	13.00/ —
Corrugated Containers	14.00/ 15.00	14.00/ 15.00*	15.00/ 15.50	17.00/ —
Double Kraft L.d. Corr. Cuts	40.00/ 63.00	40.00/ 55.00	40.00/ 63.00	55.00/ 63.00
100% Kraft Corr. Cuts	60.00/ 85.00	60.00/ 95.00	75.00/ 80.00	85.00/ —
Used Sugar & Flour Bags	45.00/ 50.00	35.00/ 40.00	45.00/ 46.50	50.00/ —
Super Resorted Br. Kraft	45.00/ 60.00	45.00/ 55.00	45.00/ 60.00	50.00/ —
New Br. Kraft Env. Cuts	100.00/115.00	100.00/ —	100.00/125.00	100.00/ —
New Br. Kraft Cuts	90.00/100.00	90.00/ 95.00	85.00/105.00	90.00/ —
No. 1 Gdwd Shvs.	30.00/ 40.00	30.00/ —	33.00/ 40.00	32.00/ —
White Newsblanks	55.00/ 70.00	55.00/ 70.00	55.00/ 75.00	50.00/ —
No. 1 Flyleaf Shvs.	40.00/ 55.00	40.00/ 55.00	45.00/ 70.00	60.00/ —
No. 1 Soft Wht. Shvs.	120.00/140.00	110.00/135.00	125.00/145.00	125.00/ —
Super Soft Wht. Shvs.	140.00/150.00	140.00/150.00	140.00/165.00	135.00/ —
Hd. Wht. Shvs.	140.00/160.00	140.00/160.00	150.00/175.00	140.00/ —
Hd. Wht. Env. Cuts	165.00/185.00	165.00/185.00	175.00/190.00	150.00/ —
New Manila Env. Cuts	100.00/115.00	120.00/ —	110.00/125.00	65.00/ —
Col. Tab Cards	80.00/ 90.00	80.00/ 90.00	80.00/ 95.00	75.00/ —
Manila Tab Cards	110.00/120.00	125.00/ —	120.00/130.00	100.00/ —
No. 1 Mixed Ledger	75.00/ 80.00	75.00/ —	85.00/ 95.00	80.00/ —
White Ledger	100.00/105.00	95.00/110.00	100.00/110.00	95.00/ —
No. 1 Book & Mag.†	33.00/ 37.00	22.00/ 24.00	29.00/ 32.00	27.00/ —
No. 1 Rep'd. Hvy. Books‡	43.00/ 50.00	32.00/ 35.00	45.00/ 57.00	40.00/ —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. § Deld.

RAG MARKET

New Domestic Cotton Cuttings
OPS Ceiling Price, CPR 28
Delivered Mill Basis

Add 7½% Dealer Commission	
No. 1 White Shirts	$21.00
No. 1 Unblchd. Muslins	21.00
Blchd. & Unblchd. Underwears	21.00
Blchd. Canton Flannels	21.00
No. 1 Light Silesias	16.00
No. 1 Light Prints	11.50
No. 1 Blue Overalls	14.50
Suntan Khakis	11.50
Add 10% Dealer Commission	
Fancy Shirts	$10.00
Indigo Blues	10.00
Mixed Khakis	8.00
Corduroys	8.00
Cottonades	8.00
No. 1 Washables	6.50

Old Domestic Cotton Rags
(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$6.00/$6.50
Cotton Pants & Overalls	6.00/ 6.25
Thirds and Blues, Repacked	5.00/ 5.50
No. 1 Roofing Rags	1.20/ 1.25
No. 2 Roofing Rags	1.00/ 1.10
No. 3 & 4 Roofing Rags	.90/ 1.00

Bagging
(Prices to Dealers, f.o.b. N. Y.)
PRICES NOMINAL

	Per 100 lbs.
Foreign Gunny	$5.50/$6.75
Domestic Gunny, No. 1	5.50/ 6.50
Heavy Wool Tares	5.50/ 6.00
Foreign Manila Rope	9.00/ 9.25
Domestic Manila Rope	9.00/ 9.25
Jute Strings	6.00/ 6.50
No. 1 Sisal Strings	8.50/ 8.75
Paper Mill Tares	5.25/ 5.50
Foreign Scrap Burlap	5.50/ 6.50
Domestic Scrap Burlap	5.50/ 6.00
Austr. Wool Pouches	7.50/ 8.00
New Burlap Cuttings	7.00/ 7.50

MATERIAL PRICES

Aluminum sulfate:
coml. bags, wks.....cwt. 1.65
iron-free, c.l. 3.25

Alcohol, ethyl:
tax free, dms. c.l.....gal. 1.01 / 1.05½
deld. East Miss.

Alcohol, methyl:
Synthetic, Zone 1, dms.
c.l. fit. alld.....gal. .44

Casein, acid prec.:
dom. sh. pt. c.l. .....lb. .27 / .38
imp. ex. dock .....lb. .20 / .30

Caustic soda:
c.l. wks. solid, 76% cwt..... 3.35
flak. & grd. 100-lb. drums... 3.75
liquid 50% tanks.... 2.55
liquid 70% tanks.... 2.65

China clay:
dom. air-float. c.l. wks.
ton 10.00
water-washed, lump, filler.... 11.00
coating ..... 17.60 /30.50
imported, ex whse...short ton 15.20 /28.35

Chlorine:
single-unit tanks, works..cwt. 2.70
multi-unit .....cwt. 3.20 / 4.40

Formaldehyde:
USP, inh. dms, c.l. wks....lb. .0625/ .0675
l.c.l., E. wks..... .0675/ .0725

Fuel oil:
Bunker C, No. 6 Cal. hvy.
tanks, refinery .....bbl. 1.95 / 2.15
light .....bbl. 2.00 / 2.25

Hydrogen peroxide:
USP, 35% cbys. E. of Miss. lb. .23½/ .26½

Lime:
hydrated, bags, wks. .....tons 13.50

Rosin:
B gum, drms, c.l. Savan..cwt. 7.00 / 9.08*
K, M, N .....cwt. 7.86 / 9.49*
FF, wood, do.....cwt. 6.80 / 7.30*
*OPS Ceiling, CPR 52.

Rosin size:
70%, gum & pale grds, tank
cars, south, sh. pt. .....cwt. 6.60 / 6.70

Salt cake:
dom. bulk, c.l. wks.....ton 17.00
wks. frt. all.....ton 20.00 /22.00

Soda ash:
light, 58%, bags, wks..... 1.50
bulk .....cwt. 1.20

Sodium silicate, 40°:
turbid. c.l. wks.....cwt. 1.30 /
l.c.l. wks. ..... 1.60 / 1.85

Sodium peroxide:
drs. c.l. E. of Miss.....lb. .21
l.c.l. do. .....lb. .21½/ .22

Soybean, protein:
chem. isol, wks, c.l.....lb. .24 / .28
Cinn. and Chic.

Sulfuric acid:
60° Be. cbys. c.l. wks.....cwt. 1.75 / —
l.c.l. wks. .....cwt. 2.05 / 2.85

Sulfur:
crude, c.l. mines, contract,
long ton 21.00 /22.00
f.o.b. vessels Gulf ..... 22.50 /23.50

Sulfur dioxide:
liquid, coml. cyl. wks.....lb. .09
multi-unit cars .....lb. .0535

Starches:
pearl corn, bags, c.l. wks..cwt. 6.44 / —
white dextrines, c.l. wks...cwt. 7.83 / —
potato, Idaho, c.l. wks....cwt. 6.50 / —
potato, Maine, c.l. wks....cwt. nominal
tapioca, conv. dextrines...cwt. 6.75 / 8.00

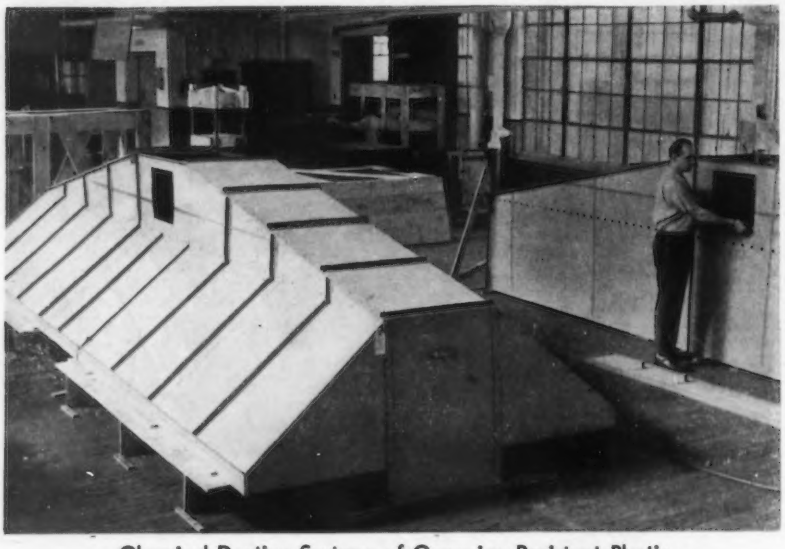
Talc:
domestic, 50-lb. sacks, c.l.
wks. .....ton 25.00 /30.00

Titanium dioxide:
anastase, c.l. deld., bags...lb. .21 / .21½
l.c.l. deld. .....lb. .22 / .22½
rutile, c.l. deld.....lb. .23 / .23½
l.c.l. deld. .....lb. .24 / .24½

NASH ENGINEERING COMPANY
421 WILSON AVE., SO. NORWALK, CONN

New Equipment

Supplies and Materials



Chemical Ducting Systems of Corrosion Resistant Plastic

Ducting systems for chemical plants made of tough, corrosion-resistant plastic are now being manufactured on a large scale by the mechanical goods division, United States Rubber Co., 1230 Sixth Ave., New York 20, N. Y. Tanks, liners, trays, hoppers, feeders, fume exhaust hoods, washers, stacks fume troughs and gutters are being specifically engineered for the handling of acids, alkalies, aliphatic hydrocarbons and other basic chemicals.

The equipment is an "all plastic" assembly, using a blend of styrene plastic and acrylonitrile rubber as the major construction material because it combines the three desirable properties of dimensional stability, toughness and chemical resistance. Reinforcing ribs, joints and corners are extruded from the plastic. Sheets used to form the sides, tops and bottoms of the ducts are of the same material. Rivets are injection molded from the plastic while bolts are machined from extruded tube stock. Joints are solvent welded with the same plastic in solution to form an airtight assembly.

Marketed under the trade name Uscolite, the finished ducts are much cheaper than stainless steel and are said to be more durable than ordinary galvanized metal or wood. Because of their relatively light weight they are more easily installed than metal or composition ducts.

Excellent resistance to hydrochloric, hydrofluoric, phosphoric and sulfuric acids is claimed. They also resist such chemicals as sodium hydroxide, potassium hydroxide, ammonium hydroxide, calcium hydroxide, ammonium chloride, copper sulphate, ferric chloride, chlorine gas or solution, bleach solution, hydrogen peroxide (3 percent maximum) oleic acid and castor oil. The ducts also have good resistance to aliphatic hydrocarbons but are not resistant to aromatic hydrocarbons, ketones, esters or chlorinated solvents, it is stated.

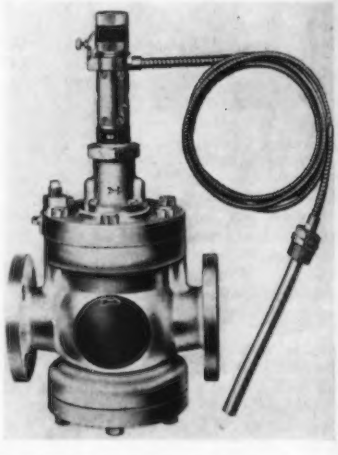
Self-Operated Temperature Regulator

A new addition has been made to the line of self-operated temperature regulators made by Farris Stacon Corp., 524 Commercial Ave., Palisades Park, N. J.

Designated as Type 1005, the regulator features design simplicity which allows quick, easy disassembly for relapping and cleaning in the field. In addition, the regulator has visual finger-tip dial control; built-in strainers to protect the pilot and main valves; stainless steel seats and discs; and internal porting to eliminate external damage and minimize maintenance.

The manufacturer claims control accuracy of plus or minus 1°F., obtained by means of a fully balanced, single-seated pilot operating on a vapor flash principle. Ninety-nine percent of the power to position the valve is taken directly from the steam, and only one percent from vapor expansion in the thermostatic system.

The Type 1005 Regulator is self-



Supplying Your Requirements

AMERICA'S LEADING INDEPENDENT WASTE PAPER PACKERS

WASHINGTON, D. C.
PHILADELPHIA, PA.
NEW YORK, N. Y.
MINNEAPOLIS, MINN.

THOMAS PAPER STOCK COMPANY
1500 No. Hooker Street • Chicago 22, Ill.

contained and pilot operated in sizes 2″ through 4″. It is available with 125 lb. or 250 lb. ASA flanges for steam pressures from 10 to 150 psig. and for temperature control from 30°F. to 325°F. Adjustment range is 60°F. Eight feet of capillary tubing and a 1″ NPT conection on the bulb are standard equipment.

Dynel Valve Covers

New valve and flange covers, designed to provide protection against leakage without hindering normal operation, have been introduced by Mine Safety Appliances Co., Braddock, Thomas, and Meade Streets, Pittsburgh 8, Pa. They are said to cost only one-third as much as previous covers.

Made of Dynel, a staple fabric which is highly resistant to acids as well as caustics, ChemKovers are said to have sufficient strength to contain sprays resulting from gasket or packing failures in pressurized lines. Not a treated fabric, Dynel has inherent qualities which give it the resistant properties desired. It will not support combustion and is easily cleaned.

The new covers require no special tools to install and can be removed easily and quickly when lines require repair. They are designed to fit all styles and sizes of valves and flanges. Complete details have been published in Bulletin No. CF-27, available without charge from the manufacturer.

Silicone Coated Novabestos

Silicone Novabestos, says the manufacturer, Irvington Varnish & Insulator Co., 6 Argyle Terr., Irvington 11, N. J., consists of a very thin, pure, long fiber asbestos sheet which is completely saturated and coated with silicone resin to produce a product having outstanding heat and electrical properties, together with good physical properties.

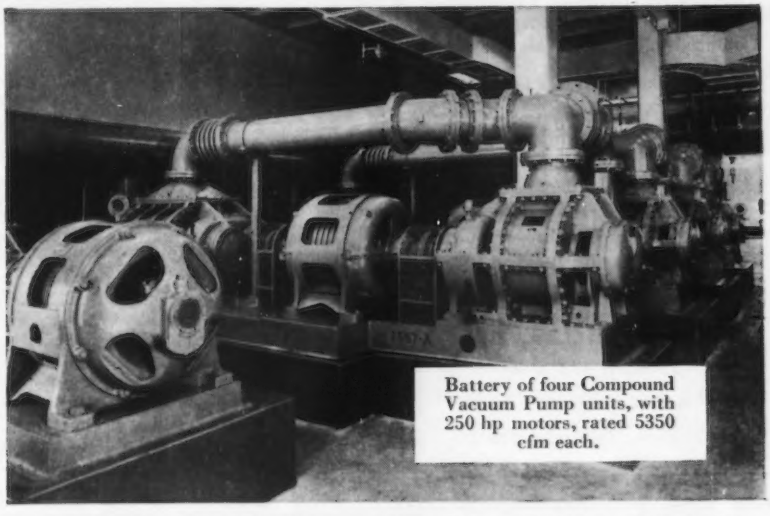
The long-fiber Novabestos used conhists of 97 percent pure asbestos together with approximately 3 percent organic material. Outstanding features of the base asbestos sheet is the long fiber construction which gives it unusual physical properties for such thin material.

Features claimed for the coated Novabestos are as follows: (a) extremely thin material, .0025″ to .003″ in thickness; (b) Class "H" insulation suitable for continuous operations of 180°C.; (c) excellent electrical properties; (d) extremely light weight.

Typical Data:

Dielectric Strength — V.P,M	
2″ Electrodes	350
Tensile Strength — P.I.W.	
Warp	10.0
Filler	3.5
Tearing Strength — Grams	
Warp	10
Filler	9
Weight — lbs./sq. yd.	.12

Available in roll and sheet form up to 20″ in width.



Battery of four Compound Vacuum Pump units, with 250 hp motors, rated 5350 cfm each.

BEFORE YOU BUY *ANY* VACUUM PUMPS CHECK THESE 5 ESSENTIALS

To maintain the quality and quantity of your paper production, your vacuum pumps must rate high when compared to these basic values, which are built into Roots-Connersville equipment. Details are available in our Bulletin 50-B-13 on Cycloidal Pumps for Paper Mill Operation. Send for a copy—or let our engineers work with you in selection of vacuum pumps for your individual needs.

1. **LOW POWER CONSUMPTION**—because units are recommended, either single or compound, to operate at the most efficient point.
2. **NEGLIGIBLE FRICTION LOSSES**—no contact between impellers or impellers and casings.
3. **HIGHER SPEEDS**—permitting direct connection to standard motors, saving first cost, space and weight.
4. **FLEXIBILITY**—to meet varying demands; suction automatically overcomes resistance in system.
5. **DEPENDABILITY**—long-time, attention-free operation, due to simplified design and construction.

Roots-Connersville Blower Corp., 522 River Ave., Connersville, Indiana

Reg. U. S. Pat. Office

ROOTS-CONNERSVILLE

BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES

1,070,000 GPD. OF SPARKLING WATER FROM SHALLOW FIELD ALONG RIVER

SINGLE CAISSON WELL installed in a formation having A 12-FOOT WATER DEPTH produced 1,070,000 gallons per day of zero-color water through induced infiltration from the river.

A Caisson Well is a large diameter reinforced concrete well, 8 to 16 feet o.d., or more, equipped with a special-metal screen at the bottom.

Why not write us or, even better, call us during your visit to the convention?

CAISSON WELLS, INC.
33 West 42d Street
New York 18, New York
Telephone: Chickering 4-7814

Light-Duty Grinder

The Rogers NT Junior is designed to combine speed and low cost for precision grinding of paper-cutting and other straight knives. Intended for light-duty work, it features a separate reversing motor which drives the sturdy reciprocating knife table assembly, according to the manufacturer, Samuel C. Rogers & Co., 193-210 Dutton Ave., Buffalo 11, N. Y.

Another feature is the combination of carefully-machined angular "V" and flat ways over which the table travels. These broad ways transmit all grinding pressures to the base of the machine where they are easily absorbed. Since the table action is reciprocating, the ways and bearings are worn smoothly from end to end, thus assuring long-operating life. A swivelling type knife bar on heavy trunions is fitted to the table. An index is included to allow for easy set up for bevel grinding to any desired angle.

The grinder is designed for a 10″ diameter cup grinding wheel to be driven by a separate ball bearing motor. A motor driven centrifugal pump forces an abundant amount of cooling liquid to the work for adequate quenching of the knife edge. Produced in four sizes: 32″, 38″, 48″, 60″ The stroke is adjustable to any length within these limits, it is stated.

MERKOR

Non-Returnable, Durable standard mill core.

GARTEX

Returnable and Non-Returnable extra strong mill core for regular and special needs.

ANY LENGTH, DIAMETER AND THICKNESS

Write for samples and prices

MERCER
PAPER TUBE, INC.
655 WEST INGHAM AVE.
TRENTON, NEW JERSEY
NEW YORK OFFICE—500 5th AVE.

Ridged Core for Paper Roll Cores

A new plug for insertion in the ends of paper roll cores has been developed by Souhegan Mills, Inc., Wilton, N. H.

Molded from resin-bonded wood particles, the plug is stronger, more uniform and more accurate than wooden plugs, it is claimed. For extra gripping power it has eight ridges molded into its circumference, will not check, crack, or shrink, yet costs no more than wood, it is stated.

Fighting Paper Wanted

Invitation to bid has been issued by the New York Quartermaster Procurement Agency, 111 East 16th Street, New York 3, N. Y., on QM-30-280-52-997, covering Barrier Material, watervaporproof, flexible, 36″ x 200 yds., 1,250 rolls. Bids will be opened February 21, 1952, at 11:00 a.m. (EST) at the New York office. This procurement is for the U. S. Army.

QM-30-280-52-1022, covering Barrier Material, waterproof, flexible, 1,300 rls. Bids will be opened February 13, 1952, at 10:00 a.m. (EST) at the New York office. This procurement is for the U. S. Army.

QM-30-280-52-1021, covering Paper, stencil board, oiled, 60,000 each. Bids will be opened February 13, 1952, at 3:00 p.m. (EST) at the New York office. This procurement is for the U. S. Army.

QM-30-280-52-978, covering Paper, teletype, various, 77,106 rls. Bids will be opened February 13, 1952, at 2:00 p.m. (EST) at the New York office. This procurement is for the U.S. Navy.

QM-30-280-52-1008, covering Paper, manifold, 25 percent rag pulp, 60,000 rms. Bids will be opened February 13, 1952, at 1:00 p.m. (EST) at the New York office. This procurement is for the U. S. Air Force.

QM-30-280-52-1017, covering Paper, tracing, white, transparentized, 22″ x 29″, 100 sheets to pkg., 900 pkg. Bids will be opened February 13, 1952, at 10:00 a.m. (EST) at the New York office. This procurement is for the U. S. Army.

Rayonier Plans Mill at Doctortown, Ga.

Rayonier Inc. has announced plans for the early construction of a new pulp mill at Doctortown, Ga., capable of producing 250 tons per day of purified wood cellulose. A mill site of 530 acres has been purchased and construction will be started as soon as steel and other materials requiring Government allocation are available.

Application has been made to the NPA for a Necessity Certificate and for allocation of the necessary materials. The new mill will provide additional tonnage to meet the growing requirements of Rayonier's customers and at the same time will afford a reserve capacity for the possible manufacture of wood cellulose for military purposes.

Proceeds from the recently announced borrowing of $40 million from the Prudential Insurance Co. of America will be used in part to finance this project, which will constitute an investment in excess of $25 million.

Rayonier already owns and operates three mills in the State of Washington and one mill in Florida, with combined annual capacity of approximately 430,000 tons. This fifth mill will have annual capacity of 87,000 tons.

A considerable enlargement of Rayonier's capacity is going forward at the present time in a $6 million special construction program at the four existing mills. This construction is expected to be completed in 1952. The Doctortown project is a further extension of the company's long-range expansion program, which has been planned to serve the steadily increasing demand for wood cellulose in the rayon, cellophane, and related industries in the United States and world markets.

An advantageous location for the mill was selected in southeastern Georgia, on the Altamaha River, at a point 38 miles from the sea, in an area where there is an abundant supply of both surface water and ground water. The site in Doctortown, near Jesup, is served by the main line of the Atlantic Coast Line Railroad, with radiating rail connections and highway approaches affording economical transportation of pulpwood from the heavily wooded surrounding area.

The mill will use an improved process which permits the production of superior grades of wood cellulose, primarily for high tenacity yarn applications, such as tire cord, parachute materials, and rubber belting. Flexibility is provided in the mill's design, however, so that it will also be able to produce nitration pulp if necessary for the manufacture of explosives, as well as pulps for special types of paper and for standard textile yarns.

To provide an assured long-term supply of raw material for this new operation, Rayonier has recently enlarged its already substantial wood resources in the South, which had been built up to support production at the Fernandina Division in Florida. Large acreages have been purchased this year, and today, the company owns or controls approximately 400,000 acres in southeastern counties of Georgia and northeastern counties of Florida.

Approximately 550 cords of wood will be consumed per day, part of which will be drawn from Rayonier's own holdings of timber, and part will be purchased from local land owners, thereby creating a sizable new market for wood in the area. The mill is designed to use all the local species of pine, as well as the local hardwoods.

Approximately 450 people will be employed to work in the mill itself, and another 400 or 500 people will work in the cutting and transportation of pulpwood.

The Doctortown project will be carried out under the executive direction of R. F. Erickson, vice-president in charge of engineering and plant development. The mill's special processing procedures were developed by Rayonier's Research Division under the supervision of Dr. A. N. Parrett, vice-president in charge of research and development. Designs for the installation of the processing equipment have been prepared by Rayonier's own engineers, and Ebasco Services, Inc., has been retained as consulting engineers to design the mill structurally.

Peru Plans Newsprint Mill

The Peruvian Amazon Corp. plans to build a paper mill at Iquitos, Peru, to make wood pulp and eventually newsprint from "Cetico," a tree growing in the area.

Cetico is not a conifer and in appearance is similar to the eucalyptus tree used for newsprint in Tasmania. It grows in abundance all over the Transandean regions of Peru but for industrial use plantations would probably have to be started. The wood is a hard fibre but apparently produces good groundwood pulp, with cellulose content of about 40 percent. The cetico tree grows to reasonable size in about six years and could be used as early as five years after planting.

CORROSION

COSTS THE PAPER INDUSTRY MILLIONS EACH YEAR

VITAL EQUIPMENT IS DESTROYED...PRODUCTS CONTAMINATED

Corrosion eats away vital equipment that today is hard to replace.

Corrosion may cause contamination of your products, resulting in unnecessary loss of production and profits.

It causes loss of output and waste of man-hours when your plant is shut down for repairs due to corrosion.

Every businessman knows this; but do you know that the total cost to American industry is $6,000,000,000 annually . . . and do you know how much corrosion increases costs in your own operations?

Perhaps the answer is Amercoat. Amercoat is a line of individualized protective coatings . . . each built to protect against a specific industrial corrosion problem.

Amercoat field engineers are available . . . without obligation . . . to check your plant for corrosion problems . . . and to make specific recommendations.

Why not start your checkup *now*? We'll be glad to help you.

AMERCOAT CORPORATION

A division of
American Pipe and Construction Co.
4809 Firestone Blvd., South Gate, California

FOLLOW THE LINE OF *most* RESISTANCE

PROTECT WITH *Amercoat*

Cortland A. Mehl, 36, a New York district salesman of American Cyanamid Co.'s Industrial Chemicals Division, died of a heart attack on January 23 at the House of Good Samaritan Hospital in Watertown, N. Y., where he was traveling for the firm.

CHAS. T. MAIN, INC.
CONSULTING ENGINEERS
Process Studies, Design, Specifications and Engineering Supervision
PULP AND PAPER MILLS
Steam, Hydraulic and Electrical Engineering Reports, Consultation and Valuations
80 Federal Street Boston 10, Mass.

The Controlled Flow
VICTORY BEATER
is manufactured by
THE NOBLE & WOOD MACHINE CO.
Paper Mill Machinery
Hoosick Falls • New York • U. S. A.

FIBER RESEARCH AND SERVICE
Semi-Chem. and Chemical Pulp Processes
Pilot Plant Facilities
THE KINSLEY CHEMICAL COMPANY
Cleveland 11, Ohio

MISCO
STAINLESS STEEL CASTINGS
FOR ALL EQUIPMENT EXPOSED TO CORROSION BY SULPHITE ACIDS OR OTHER CORROSIVE AGENTS
MICHIGAN STEEL CASTING CO.
DETROIT 7, MICHIGAN

GOVERNMENT GOSPEL

C/N Progress

DPA reports as of December 31, 1951, 46% of the total value of "Certificates of Necessity" was in place. This figure is based on certificates issued prior to September 30.

The pulp mill program totaling $306 million was 36% in place. Paper and Board mills totaling $157 millions was 31% in place.

For comparison purposes, other industries are as follows:

Alkalies & Chlorine	36%
Industrial Inorganic Chem.	23%
Industrial Organic Chem.	60%
Petroleum Refining	38%
Blast Furnaces	19%
Rolling Mills	41%
Aircraft	67%
Electric Power	50%
Aluminum Refining	27%

CPR 91, Amdt. 1.—Writing Paper And Other Fine Papers

The OPA has issued Amendment 1 to Ceiling Price Regulation 91, Writing Paper and Other Fine Papers, making minor changes in provisions of the regulation and correcting certain typographical errors.

Changes in provisions, effective January 16, 1952, are designed to make the regulation conform to industry practices.

The changes and corrections include:

(1) An increase from 5 to 8 cents per 500 sheets in the allowed charge for cutting rag content onionskin and manifold papers and related grades in small sizes.

(2) Establishment of a single price classification for No. 2 watermarked and No. 2 unwatermarked chemical wood pulp onionskin and manifold papers. New base price ceiling: Basis weight 7 to 9 pounds, $3.90 per 1,000 sheets; basis weight 10 pounds, $4.10 per 1,000 sheets (sheet size 17" x 22").

(3) Elimination of a plus differential for broken cartons and bundles of chemical woodpulp and onionskin manifold papers of 50 cents per carton or bundle.

(4) Reduction of the base price for 75 percent rag ledger from $39.50 to $39 per hundredweight.

(5) Reduction of differentials for packing chemical wood pulp index bristol board and related grades to the following figures: Packing rolls, 2,000 to 9,999 pounds (one grade), 50 cents per hundredweight; packing rolls 10,000 pounds or over, 20 cents per hundredweight.

Revise Wage Adjustment Petition Forms

The Wage Stabilization Board has issued a revision of its form for the filing of petitions for wage adjustments. It was made available in all of the WSB's regional offices and the 77 field offices of the Wage and Hour Division of the U. S. Department of Labor, which are acting as contact points for WSB.

The form, the most important in use by WSB, is titled "Form 100" and comes with a new revised instruction sheet. It is to be used in all petitions made to WSB for wage or salary adjustments except reports made under WSB's new regulation dealing with health and welfare plans.

Other NPA Developments

Delivery of controlled materials delayed from a previous quarter may be accepted on a construction project without necessity of charging them against the current quarter's allotment.

Second quarter allotments of steel, copper and aluminum, recently formulated, will reflect the growing pressure for defense production use of these materials, it is indicated. Allotment of copper wire mill products, mostly copper wire itself, for the second quarter, total 18 million pounds under the first quarter allocation of 396 million pounds, it was revealed.

Military requirements for aluminum are reflected in lowered allowances for commercial construction, containers and packaging and a number of other uses.

Packaging machinery manufacturers were recently "briefed" on amendments to the CMP which will affect the outlook for machinery for packing food in tin cars, cartons, bags and bottles; capping, sealing, etc.

Recent amendments will permit purchasers of controlled materials to charge shipments of steel, copper and aluminum to their allotments for the quarter during which delivery was originally scheduled, not to a later quarter; a move to remove incentive for accumulating large inventories of such materials was seen in the NPA amendment which would prevent manufacturers of Class B products, under CMP, from putting into production in any quarter, a quantity of controlled materials greater than that allotted, unless specifically authorized to use controlled materials in inventory in addition to the allotted amount.

Gair Takes Over American-Coating Mills

Robert Gair Co., Inc., New York, and Owens-Illinois Glass Co., Toledo, Ohio, have signed a contract providing for the sale by Owens-Illinois of the manufacturing plants, business and inventories of its American Coating Mills Division to Gair on April 1, 1952.

Under the transaction, Robert Gair Co., Inc. will acquire paperboard mills at Elkhart, Ind., and Middletown, Ohio, and carton fabricating plants at Elkhart, Chicago, Ill., and Grand Rapids, Mich. In exchange, Owens-Illinois will receive approximately 400,000 shares of common stock of Gair and a substantial cash consideration. Inventories will be purchased for cash. Gair will shortly call a stockholders' meeting to approve the transaction and authorize the necessary additional common stock.

The manufacturing operations of Owens-Illinois which are devoted to making corrugated boxes for the company's products will not be included in the transaction.

The business of American Coating Mills will be operated as a separate division of Gair under the direction of R. L. Snideman, president of American Coating Mills, and his staff. American Coating Mills will continue to service its present customers and as a result of the transaction will have an additional source of all grades of paperboard, and will be able to offer its customers other products heretofore made exclusively by Gair. The additional plants acquired through this transaction will enable Gair to extend its line of products, and to increase service to customers located in the Middle West.

Robert Gair Co., Inc. operates twenty-four plants concentrated principally in the Eastern seaboard states and Canada, and a Kraft paper mill in Georgia with its more than 300,000 acres of Southern timberland. Its products include all grades of paperboard, folding paper cartons, corrugated and solid fibre shipping containers and pulp.

Discontinue Adams Operations

Paper-making operations by Crane & Co. of Dalton at the upper mill of the L. L. Brown Paper Co., Adams, Mass., were discontinued as of January 12.

The Dalton firm began operations at the Brown mill last April and at that time officials of Crane said that manufacturing would be for a temporary six- to eight-month period. A working force of about thirty persons has been given employment since the mill began operations last April. Timothy J. Morrison, Jr., of Dalton, assistant superintendent of the Pioneer mill of the Crane company at Dalton, has been in charge. No comment was available as to whether operations might resume at a later date.

Honor J. T. Flannery

The Atlantic Division of the National Assn. of Waste Material Dealers, Inc., paid tribute to James T. Flannery, James T. Flannery Co., Jersey City, N. J., who completes his third term as president of NAWMD in March, at its meeting in the Warwick Hotel, Philadelphia, Pa., January 24. It was "Jim Flannery Night" at the dinner-meeting of the gathering. This will be the last area division meeting Mr. Flannery will attend before NAWMD's March election of officers. The Atlantic Division also is Mr. Flannery's "home" group, as his firm is within the Atlantic area.

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1951	Dec. 22 97.4	Dec. 29 63.6	Jan. 5, '52 93.4	Jan. 12 98.6r	Jan. 19 99.1
1950	Dec. 23 95.2	Dec. 30 69.2	Jan. 6, '51 94.2	Jan. 13 100.0	Jan. 20 101.3

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1951	99.3	101.3	101.9	102.8	102.2	100.1	88.6	97.7	94.3	100.6‡	98.2‡	89.3‡	98.4‡
1952													

‡ Preliminary.
r Revised.

COMPARATIVE YEARLY SUMMARIES

	1945	1946	1947	1948	1949	1950	1951	1952
Year to Date Year Average	89.4	101.1	104.3	96.2	88.6	95.8	98.4‡	

PAPERBOARD OPERATING RATIOS†

1951	Dec. 22 86	Dec. 30 40	Jan. 5, '52 64	Jan. 12 86	Jan. 19 85
1950	Dec. 23 105	Dec. 30 63	Jan. 6, '51 91	Jan. 13 106	Jan. 20 104

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Ave.
1951	102	105	104	105	104	103	84	94	86	87	82	75	94
1952													

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

ENGLISH ECCO CLAYS TRADE MARK CLAYS

UNIFORM SUPERIOR DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

CLEARING HOUSE

HELP WANTED

MEN WANTED—POSITIONS OPEN

We can place—Superintendent Fourdrinier machine mill on manifold, onion skin, bond, sulphite and rag papers; general supt. for pulp and paper mills; manager, supt. and tour boss for mill making papers for conversion into waxed papers; gen. supt. large board mill, excellent salary; production mgr. for southern fine paper mill; asst. mgr. of mfg. large pulp and paper mill and converting dept. combined; asst. supt. Fourdrinier mill; asst. supts. Cylinder board mills.

Chemists, chemical engineers and laboratory men for mills also for demonstrating and selling; master mechanics, plant engineers, designers and draftsmen, salary range $4,000-$12,000 year; chief engineer for northern firm, preferably a mechanical or chemical engineer with at least 10 years experience in paper industry. Must be experienced in construction jobs and competent to organize and control an eng. dept., attractive salary; Cylinder and Fourdrinier machine foremen; night foreman sulphite pulping; salesmen for fine writing papers, woven felts and paper and pulp mill machy.; machine tenders and back tenders.

LIST YOUR CONFIDENTIAL APPLICATION WITH US to keep informed of attractive positions open in the pulp and paper mills.

CHARLES P. RAYMOND SERVICES, Inc.
294 Washington St., Boston 8, Mass.

SPECIALISTS IN PLACING AND IN SUPPLYING PULP AND PAPER MILL EXECUTIVES F-1

PAPER PROCESS ENGINEER

Should have knowledge of paper converting in coating, laminating, cutting, assembling and printing. Desirable to have experience in writing of process sheets for such operations. Can consider education or experience in paper mill operations, or similar chemical engineering; possibly background of mechanical design on paper converting machinery. Location Chicago. Address Box 5245 care Paper Trade Journal.

F-1

PLANT ENGINEER—Opportunity for qualified graduate Engineer with extensive experience in general plant engineering and operations in the Pulp and Paper Industry and particularly the kraft process. Address Box 52-2 care Paper Trade Journal. TF

SUPERINTENDENT for Eastern Mill manufacturing fine papers. Must be a good production manager. State experience. Address Box 52-31 care Paper Trade Journal. F-1

HELP WANTED

SALARIED POSITIONS $3,500 to $35,000. We offer the original personal employment service (established 42 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC. —117 Dun Bldg., Buffalo, 2, N. Y. TF

WANTED—Master Mechanic or Assistant for modern 3-Machine Tissue Mill. Progressive management; expansion program now under way. Fine opportunity for young/middle aged man to advance. Substantial paper mill mechanical experience with electrical background desirable. Give complete resume of experience in letter to Box 51-442 care Paper Trade Journal. Replies held strictly confidential. TF

PAPER BAG SALESMAN

Multi-Wall Experience.

Positive potential awaits aggressive man with proven record of successful sales in multi-wall field.

You will be backed by one of country's largest manufacturers of paper bags with modern, fully equipped plants and paper mill.

Man we seek will represent company in Metropolitan New York and surrounding territory.

Salary and/or Commission . . . plus expenses.

Excellent opportunity. Send complete confidential resume to Box 52-42 care Paper Trade Journal. F-1

SALES ENGINEER

Chemical or mechanical, with experience in sulphate mill recovery operations and equipment. Reply should include personal data, resume of experience, photo if available and telephone number. Our employees know of this advertisement. Write Box 52-41, c/o Paper Trade Journal. F-1

Engineering Draftsmen or Machine Designers, also experienced Detailers.
A well established Wisconsin firm has permanent positions in Engineering Department for qualified men.
Experience in paper and pulp mill machinery or heavy equipment desired. Please submit complete resume and salary requirements when replying to Box No. 52-38 care of Paper Trade Journal. F-15

WORKING SUPERINTENDENT for small fast growing Eastern mill making lightweight specialties. Cylinder machine experience essential. State qualifications and salary expected. Address Box 51-596 care Paper Trade Journal. TF

MECHANICAL ENGINEER—Age 35 to 40, preferably with maintenance experience with knowledge of steam power plant and turbines. Good opening for future executives position in Michigan Board Mill. Replies treated confidentially. Address Box 52-40 care Paper Trade Journal. F-8

RATES FOR CLEARING HOUSE ADVERTISING

HELP WANTED—75c a line. Minimum charge $3.75.

SITUATIONS WANTED—75c a line. Minimum charge $3.75. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—75c a line. Minimum charge $3.75.

WANTED—75c a line. Minimum charge $3.75.

OPPORTUNITIES—75c a line. Minimum charge $3.75.

Classified advertising space may also be purchased at $5.00 per single column inch. All classified advertisements are payable in advance. If box number is used—70 cents additional.

Address replies to advertisements appearing under Box Number in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York 19, N. Y.

FOR SALE

CAMERON SLITTERS

1—42" Type 26-2A
1—52" Type 9-S
1—52" Type 8-S
1—42" and 1—62" Type 6
1—32" and 1—42" Type 40-2A.
1—42" and 1—62" Type 40-1-AF.
1—72" Type 10-8-14 Shear Cut.
1—72" Type 10-S.
1—62" and 1—72" 10-S.
1—62" and 1—82" Type 10.

OTHER SLITTERS

1—62" Beck Duplex Rewind Razor Blade Slitter & Rewinder. Suitable for paper and plastics.
1—48" Meisel Shear Cut, Series O.P. 2.
1—62" Type AA Langston Shear Cut.
1—30" Langston Type A Shear Cut.
1—42" Kidder Merchant Model Pneumatic Control Shear Cut.
1—40" Hobbs Shear Cut, duplex rewind, with AC motor.

POWER PAPER CUTTERS

10—Seybold, 65" 6Z, 44", 54", 63" and 74" 20th Century; 48" and 55" Holyoke; 50" and 74" Dayton.
5—Oswegos, 32", 38", 44", 50" and 55".
5—Sheridans, 34", 36", 40", 50" and 55" & 1—32" Perfection Model.
1—Dexter 50".
5—Acme, 32", 34", 36", 46" and 50".
1—Smith & Winchester Undercut 63".

MISCELLANEOUS MACHINES

1—36" Hudson-Sharp A-2 3 color Aniline Printing Press, with 4-A Sheeter. Roll to roll or roll to sheet.
1—24" Schultz Automatic Waxed and Shelf Roll Machine. Rewinds 25' to 250'.
1—6½" and 1—20" four unit Champlain Rotogravure Presses.
1—72" Hudson-Sharp 25W Winder for Waxed and Household paper rolls.
1—34" Waldron Gummed Paper Breaker.
1—40" Special roll to roll coater or Lacquer saturator.
1—48" Waldron Roll to Roll Lacquer Coater
1—42" Waldron, 2 Roll, Roller Coater. Puts 2 coats on both sides of web at one time or any combination. Applies any material to paper, cellophane, plastics, etc.
1—Weber 5AG Grocery Bag Machine. Range 4¼x10¼ to 7¾x19¼.
1—Smith & Winchester Sack Machine. Range 11x26 to 17x31, suitable for Shopping Bags.
1—Sheridan Die Press, Model 88 Platen 33" x 46". Automatic Feeder.
1—New 24"—2 color, Roll to Roll Aniline Press.
1—52" Waldron Anti-friction Embossing Machine with Slitting attachment.
1—49" 2 Color Wolverine Aniline Hydro-Printer. Roll to Roll.
1—30" 3-color Wolverine Aniline Press. Roll to roll.
1—Kidder 36"x48" 2-color Rotary Wrapping Paper Press.
1—45" Robinson Scorer.
2—Petdevin Waxing Machines, 32" wide.
1—Hudson-Sharp 3-deck Napkin Machine. 17" max. width x 16½" cut-off.
1—45" and 1—48" Hamblet Rotary Sheeter.
1—64" Dillon Duplex Rotary Sheet Cutter.
1—94" Moore & White Duplex Rotary Sheet Cutter.
1—116" Model 29 Hamblet Duplex Rotary Sheet Cutter, slitting attachment, Erie automatic layboy and twelve roll backstands.
1—36", 1—50" and 1—74" Hamblet Single Rotary Sheeters with Layboys, Slitting attachments and Backstands.
2—Asphalt Laminating machines, one 70" and one 88".
1—1 color Rotary-X Gummed Tape Printing Press.
1—84" Carthage wood chipper, 10 knives, belt drive.
2—36" x 76" Wet Machines.
2—#2 Lamoye Pulpers.
2—2000 lb. Niagara Iron Tub Beaters.
1—162" Moore & White 4-drum winder.
1—10' diam. x 132" face Beloit Yankee Dryer.
1—114" Sandy Hill eleven roll stack of Calenders.

We Want YOUR Used Equipment—Write Us NOW

GIBBS-BROWER CO. INC.

Please address reply to Room 902
21 East 40th Street, New York 16, N.Y.
Telephone Lexington 2-5759

F-1

HELP WANTED

ADJUSTER, experienced on satchel bottom paper bag machines Potdevin, Fischer, S & W. Excellent opportunity metropolitan district. Address Box 52-43 care Paper Trade Journal. F-15

WORKING SUPERINTENDENT—For one machine folding boxboard mill. Must be capable assuming full responsibility for production and quality. $10,000 year starting salary. Address Box 52-44 care Paper Trade Journal. F-22

SITUATIONS WANTED

MAINTENANCE MACHINIST fourteen years in paper converting, desires position in New York Area. Address Box 52-39 care Paper Trade Journal. F-15

SUPERINTENDENT—Are you in need of a good superintendent experienced on towels, tissue and napkins for $8,000 per annum? Sufficient experience in all phases of the mill to qualify for a manager's position. Age 40. Address Box 52-37 care Paper Trade Journal. F-8

SITUATIONS WANTED

CHEMICAL ENGINEER — Paper school graduate desires connection with progressive company. Ten years varied experience in development and management in paper industry. Address Box 52-29 care Paper Trade Journal. F-8

PLANT ENGINEER—MECHANICAL SUPERINTENDENT. College and technical education. 25 years engineering and maintenance experience in paper mills and converting plants. Cylinder, Fourdrinier, Wet Machines, Corrugators and all box plant equipment. Power. Familiar with all trades. Assume full responsibility. Available after Feb. 1st. Address Box 52-15 care Paper Trade Journal. F-1

FOR SALE

PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon Laboratory Coating and Treating and Flat Ream Measuring and Converting Machines. New improvement. THE MAYER MACHINE COMPANY, INC., 1313 Buffalo Road, Rochester, 11 N. Y. TF

FOR SALE

FOR SALE
1—Roberts Grinder for 4' wood, with stone and 2500 h.p. motor, with controls. New 1947. Used 6 months.
2—Reliance 2500 h.p. slip ring motors. 66 intervals —3 phase—60 cycle—257 r.p.m., with complete controls.
2—500 ton Pulp Baling Presses with pumping units and motor.
ROSS PAPER MACHINERY COMPANY
265 Passaic Street Newark, 4, N. J.
Tel. HUmbodlt 2-2177 F-1

FOR SALE—Cameron 62" & 36" Slitters & Rewinders; 7" Brightwoods. SELLING OUT COMPLETE SET-UP BOX PLANTS. Bargains. Address Box 52-23 care Paper Trade Journal. TF

FOR SALE—Two machine board mill located in New York State, modern, one-story. Factory building goes with property, also water power. Address Box 52-33 care Paper Trade Journal. F-1

FOR SALE—22 x 24 Seybold 4-rod Embosser, immediately available; 37 x 52 Wagner Power Offset Proof Press; 74" Seybold 20th Century Power Cutter. Address Box 52-34 care Paper Trade Journal. F-1

TELEPHONE HUMBOLDT 2-2177

CABLE ADDRESS: JACKROSS

ROSS PAPER MACHINERY CO.

265 PASSAIC STREET
NEWARK 4, N. J.

CONVERTING PAPER MAKING EQUIPMENT

NEW, USED, REBUILT PAPER AND PULP MACHINERY

MACHINERY WANTED FOR OUTRIGHT PURCHASE
From a Single Item to A Complete Mill.

BEATERS
1—Ditts 750 lb. Iron Tub. Roll 44" face x 50" diameter.
1—Downingtown 1000 lb. Iron Tub. New roll 48" face x 48" diameter.

CALENDER ROLLS
48 Chilled Iron Rolls—Assorted sizes.

CALENDER STACKS
1—3 roll—62". All rolls bored for steam.
1—Farrel Birmingham, 5 roll, 108" Calender Stack, with doctors, 2 rolls bored-for steam.
1—Black Clawson 124" 9 roll with doctors and oiling system.
1—Black Clawson 124" 7 roll with doctors and oiling system.
1—Black Clawson 90" 7 roll with 3 spare rolls.
1—Pusey & Jones 84" 4 roll, with doctors and drives.

CYLINDER MOLDS
1—134" face x 36" diameter, with stainless steel shafts.

DAMPENER
1—Valley Micromist Unit for water finish on paper—120" deckle.

DRYERS
2—124" face x 48" diameter.
1—77" face x 48" diameter—with gear.
1—120" face x 16" diameter—Baby Dryer.
1—102" face x 48" diameter, with bearings.
3—110" face x 42" diameter with bearings and gears.
1—109" face x 42" diameter Creping Dryer.
4—42" face x 36" diameter, with frames, gears and bearings.
18—48" face x 48" diameter, with gears, bearings and steam joints.
20—128" face x 42" diameter.
3—116" face x 48" diameter.
2—103" face x 48" diameter.
2—116" face x 36" diameter, with gears and bearings.
1—110" face x 48" diameter.
12—65" face x 36" diameter. Complete with 2 deck frames, gears, bearings, steam joints, felt rolls, sole plate and 2 press sections.

EXTRACTOR ROLLS
1—Downingtown Extractor Roll 128" face x 24" diameter. Anti friction bearings.

FILTERS
1—Oliver Vacuum Filter, Cylinder 8' face x 5' 8" diameter. Iron end vat.

FLAT SCREENS
3—8 plate Sandy Hill Roller Shoe with scrapers.
1—Sandy Hill 12 plate roller shoe.
3—Bagley & Sewall 8 plate, with scrapers and plates.
1—6 plate tailing screens with scrapers.
1—4 plate tailing screen with scraper.

HYDRAPULPER
1—Shartle Brothers 16' batch Hydrapulper with hydraulic dump valve and skip hoist. Complete, including drive—less motor. New 1947.

HYDRAULIC PRESS
1—Thorpe 200 ton. Steam platens. 40"x40" with pumps.

JORDANS
1—26 Miami, for motor drive.
3—Jones Majestics with base and couplings—
2—23 Appleton with base and coupling.
1— Jones Majestic. Stainless Steel Filling.
3—E. D. Jones Pony. 3/16" stainless steel fillings—banded plugs. Spare new fillings.
1—Smith & Winchester Stainless with granite fillings.

LABORATORY EQUIPMENT
1—Noble and Wood anti friction Jordan 13" plug —¼" stainless steel fillings—direct connected to 10 h.p. 220/440/3 phase 60 cycle, 530 r.p.m. motor.

LAMINATOR
1—Black Clawson Duplex 65" Laminator with 5 presses—6 dryers 36" diameter. Unwind stands and rewind stands.

MOTORS
2—Reliance 2500 h.p. slip ring motors. 66 interval—3 phase—6-cycle—257 r.p.m., with complete controls.
2—Westinghouse 200 h.p. 2200 volts—3 ph.—60 cycle—600 r.p.m. Synchronous speed with controls and grids.
1—Westinghouse 150 h.p. 2200 volts—3 ph.—60 cycle—580 r.p.m. with controls and grids.
1—General Electric—75 h.p.—2200 volts—3 ph.—60 cycle—430 r.p.m.
1—Allis Chalmers 30 h.p. 440 v. 660 r.p.m.
1—General Electric—25 h.p.—230 volts—3 ph.—60 cycle—300/900 r.p.m.
25 other 440 v. motors from 2 h.p. to 15 h.p.

PULP BALING PRESS
2—500 Ton Pulp Baling Presses with pumping unit and motor.

PULP EQUIPMENT
1—Mitts & Merrill #17 Pulpwood chipper.
1—Bird ball bearing Pulp Screen. Practically new. Used 6 months.
2—APMEW Ball Bearing Pulp Screens—30 ton capacity—outward flow.
1—D. J. Murray 10' x 25' Barking Drum.
1—Carthage 10 knife Chipper 16" spout with belt drive.

PULPERS
2—#2 Lamneyo

PULPWOOD GRINDER
1—Roberts Grinder for 4' wood, with stone and 2500 h.p. motor, with controls. New 1947. Used 6 months.

MOTORS

PUMPS
44—Centrifugal Pumps, open & closed impellers. Direct connected or Belt Driven. Extended base for motor. Assorted capacities and heads. Most used less than one year.

REDUCERS
1—Link Belt 40 h.p. Ratio 2.2-1, 500 r.p.m.-227 r.p.m.

REELS
1—2 bowl 104"—22" diameter iron bowls.
1—2 bowl 94"—16" diameter bowls.

ROLLS—PRESS, COUCH, etc.
32—Press rolls, brass and rubber covered.
14—Couch rolls, brass and rubber covered.
250—Brass and steel carrying rolls.

ROTARY SCREENS
1—#2 Bird—Copper Vat.

SCREW PRESSES
1—Valley Voith Screw Press Size 2.
1—Valley Voith Screw Press—enclosed drive.

SHEETERS
1—Hamblet 124" Duplex Sheeter with maxim layboy—8 roll backstand—motor and starter.
1—Moore & White Simplex 114" Sheeter with slitters—counter. Maxim layboy overlapping delivery. 8 roll backstand, motor and starter.
1—48" Kidder Seet Sheeter.
1—64" Duplex Dillen with 15 roll Back Stand.
1—Beloit 112" duplex Sheet Cutter with duplex overlapping layboy, drive and motor.

SHREDDERS
1—American 32" Hamermill, anti-friction bearing.
1—Jeffrey 26½" Knives—7 knife rotor—6 knife bed plate. Ball bearing.

SLITTERS AND WINDERS
1—Beloit 125" Paper Machine Slitter and Rewinder—42" rewind.
1—Hudson Sharp 25W—66" Wax roll slitter and rewinder. New 1947.
3—Cameron 42" Model 6—24" rewind.
2—Miesel 42".
1—Cameron 42"—Model 26—2A.
1—Beloit 80" 2 drum, with Lewellyn Drive, shear cut slitters, backstand—34" rewind.
1—Langston 50" Shear Cut with 25 sets of slitters and motor.
1—Cameron 44" model 9-5.

STEAM TURBINES
1—De Laval 225 h.p. Initial pressure 140 p.s.i. Exhaust pressure 35 p.s.i. Complete with gear reducer.
1—De Laval Variable speed—375 h.p. at 135 gauge and 30 p.s.i. exhaust. Complete with gear reducer.

STOCK PUMPS
1—Shartle 10 x 20 Single Plunger Pump.
2—Beloit 8x10 Triplex.
2—Deming 7 x 8 Triplex—all bronze. New 1947. Enclosed drives.

STUFF PUMPS
1—Triplex—7 x 14. Used less than 1 year.
2—Shartle Agi-flo. Suction 13" discharge 14" and 4". Anti friction bearings.

SUCTION COUCH ROLLS
2—Millspaugh 36" diameter x 234" drilled face with enclosed drive, water cooled bearings, 12" suction boxes and 1 spare shell.

SUCTION PRESS ROLLS
1—Sandusky 97" drilled face x 14" diameter.
1—Millspaugh 50" face x 14" diameter.

SUPERCALENDERS
1—Norwood 74" 9 roll with unwind and rewind. Complete with drive and 2 spare rolls.
1—Norwood 64" 10 roll with unwind and rewind. Complete with drive and 2 spare rolls.
1—Norwood 38" 9 roll with unwind and rewind. Complete with drive and 2 spare rolls.

TOILET TISSUE PERFORATOR
1—Paper Converting Machine Co. Model 141 automatic 81" Perforator, slitter and Winder —with three motors—ball bearing.

VACUUM PUMPS
2—Nash ½ H-5 Vacuum Pumps
2—Nash #3.
1—Nash #2.

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1—84" Potdevin complete from let off to single roll rewind section.
1—84" Special—complete from 2 roll let off to single roll rewind.

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1—Morrow Stevens type IC. Package thickness ¾" to 5". Used 30 days.

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1—New Sandy Hill 100" face x 72" diameter, with bearings and doctor.

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1—60x36" cast iron Shartle breaker beater with cast iron tub
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1—48x48" Stout, Mills and Temple with cast iron tub

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48"—68"—72"—80"—84"—89"—96" and 114" — 120"—156"

SUPERCALENDERS
55"—83"—108"

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1—Ten knife 84" Carthage

SHEET CUTTERS
48"—73"—84"—90"—108"—124"—130"—156"

DRIVES
1—Five unit Westinghouse new, used on 76" machine, 300 FPM
1—Eight unit Westinghouse used on 140" machine, 950 FPM
1—Nine unit Harland used on 168" machine, 650 FPM

(REEVES DRIVES)
1—Number 0
4—Number 00

DRYERS
5—60x174"
1—10 ft. x 104" (Yankee)
3—48x86" Bearings & Gears
1—48x52" stainless steel clad
30—48x46" chromium plated

FOURDRINIER PARTS
1—150"; 1—140", 1—100" & 1—82"

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5—Four pocket Carthage
1—Hanchett knife grinder, 14" grinding wheel
1—Bridgeport safety Emery Wheel Co. 36" grinding wheel

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1—Ohio

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1—No. 2 Emerson Jr.
1—Jones Imperial
1—Jones Standard

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2—Vertical Waterproof General Electric 125 HP 550 volts, sixty cycle, three phase
2—General Electric 2800 HP, synchronous, 2200 voltage sixty cycle, three phase

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1—VM 4 PIV with GE motor and sheave
1—HMM PIV with GE motor

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1—L6 Nash all bronze practically new
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1—8" Shartle distintegrator with tank
1—Shartle agiflow centrifugal 200 GPM
1—Worthington two stage water pump—750 gal. —120' Head

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1—Jones with Link Belt reducer, size DM10LH
1—Jones with Falk reducer, size 70DU

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1—Giant 2B made by Taylor Stiles

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1—200 HP Terry
1—Falk Herringbone 4HA Ratio 3.27
1—Universal ¾ HP Ratio 720:1

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1—150" Pope reel
1—210" Bagley & Sewall, anti friction bearings

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2—Bauer 24" Single disc
1—No. 1 Claflin
1—No. 4 Shartle cyclifiner
1—Weiner

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1—Westinghouse, SH16, speed reducer, new, takes 50 HP motor Ratio 8:1

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1—24"x130" suction extractor roll with frames, bearings, pump and motor
1—12x179" Plain extractor roll

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(SUCTION COUCH)
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1—25x158"

(SUCTION FELT)
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(SUCTION PRESS)
1—30x190"
1—18x158"
1—18x104"

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2—12 plate Packer
1—10 plate Packer
2—Leith Walk
2—Jolly 6 plate
2—No. 2 Bird (screen plates for #2 & #3)
1—Wandell

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110"—142" (new)—152" (new)—168" Voith

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1—82" type 10, model 10A Cameron
1—42" Cameron 26
1—208" Moore & White 4 Drums
1—116" Warren
1—116" Moore & White 2 Drum

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1—150 HP Westinghouse with gear reducer unit, new 1944

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1—Lancaster 3 cylinder 36x48

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125	West.	Syn.	277	
100	G.E.	S.R.	450	I M
100	West.	Syn.	900	
100	G.E.	S.C.	1750	IK
100	West.	S.C.	1200	CS
75	West.	S.C.	900	CS
60	West.	S.R.	575	CW
50	West.	S.C.	1750	CS
50	West.	S.C.	900	CS
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4-50	G.E.	S.C.	1750	KT
40	G.E.	S.R.	860	MT
25	500 v. West.	S.C.	1750	CB365
25	Cr.Wh.	S.C.	865	
25	West.	S.C.	1750	CS
20	Al. Ch. (new)	S.C. (Hi-Torq)	1685	ARWHH
20	West.	S.C.	1750	CS
15(2)	Al.Ch.(New)	S.C.	1200	AR
15	Al.Ch.(New)	S.C.	1800	AR

HP	Make	Wdg	Spd.	Type
10	West.	S.C.	570	C8566C
10(5)	Al.Ch.	S.L.	575	ARY
10	West.	S.C.	1200	C8370C
10(2)	Al.Ch.(New)	S.C.	1200	AR
10	Al.Ch.(New)	S.C.	1800	AR
7½	Al.Ch.(New)	S.C.	1200	AR
7½	Al.Ch.(New)	S.C.	1800	AR
7½(3)	Al.Ch.	S.L.	570	ARY
7½	G.E.	S.C.	1200	KT
7½	West.	S.C.	3440	C8254Y
5	West.	S.C.	1200	CS
5/1½	L.A.	S.C.	500/1600	255S
5	Burke	S.C.	420	EM2
5(3)	Al.Ch.(New)	S.C.	1200	AR
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2	550v.West.	S.C.	1750	C8224

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Greenville, South Carolina
Engineers
PAPER & PULP MILLS • WASTE DISPOSAL • TEXTILE MILLS • APPRAISALS • WATER PLANS • STEAM UTILIZATION • STEAM POWER PLANTS • HYDRO-ELECTRIC • REPORTS

COUPLINGS
The Bagley & Sewall Company
Black Clawson Company
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John

CRANES
Reading Crane & Hoist Corp.
Whiting Corp.

CURL TESTER
Thwing-Albert Instrument Co.

CUTTERS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Gibbs-Brower Company, Inc.
Graphic Arts International Corp.
Thomas W. Hall Co.
Jagenberg-Werke Akt. Ges.
Moore & White Co.
Perkins & Son, Inc., B. F.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
The Smith & Winchester Mfg. Co.
Taylor, Stiles & Co.

CYLINDER MOULDS
Black-Clawson Co.
Improved Paper Machinery Corp.
Manchester Machine Co.
Rice Barton Corporation

CYLINDERS
M. W. Jenkins Sons, Inc.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DECKLE WEBBING
Williams-Gray Co.

DEFIBRATORS
American Defibrator Co.

DE-INKING
Dilts Machine Works
General Dyestuff Corp.
Kinsley Chemical Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DEINKING CHEMICALS
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Kinsley Chemical Co.
Nopco Chemical Co.

DE-MINERALIZING EQUIPMENT
Hungerford & Terry, Inc.
The Permutit Company

DEMULSIFIERS
Wyandotte Chemicals Corp., Michigan Alkali Div.

DENSOMETERS
Bunge Pulp & Paper Co.
W. & L. E. Gurley

DESIGN CONSTRUCTION
Ebasco Services

DETERGENTS
American Cyanamid Company Industrial Chemicals Division
Calgon, Inc.
Diamond Alkali Co.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
American Cyanamid Company Industrial Chemicals Division
General Dyestuff Corp.
Nopco Chemical Co.

DIFFERENTIAL SCALES
Thwing-Albert Instrument Co.

DIGESTERS CIRCULATING SYSTEMS
Fibre Making Processes, Inc.

DIGESTERS
Babcock & Wilcox Co.
Biggs Boiler Works Co.
Blaw Knox Company
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.
Lukenweld
Pandia, Inc.
Paper & Industrial Appliances
Fusey & Jones Corp.

DISPERSING AGENTS
Calgon, Inc.
Diamond Alkali Co.
General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DOCTORS
The Bagley & Sewall Company
Bird Machine Company
Black Clawson Company
Downingtown Mfg. Co.
Lobdell United Co.
Lodding Engineering Corp.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
The Bagley & Sewall Company
Bird Machine Company
Lodding Engrg. Corp.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.

DRIERS
The Bagley & Sewall Company
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Lukenweld
The Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Red-Ray Mfg. Co., Inc.
Rice Barton Corporation
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIERS—LABORATORY
The Noble & Wood Machine Co.

DRILLED SUCTION COUCH ROLLS
Manchester Machine Co.

DRILLED SUCTION DRUM ROLLS
Manchester Machine Co.

DRIVES
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Bird Machine Co.
Black Clawson Company
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Farrel-Birmingham Co.
Jeffrey Mfg. Co.
General Electric Company
Gibbs-Brower Company, Inc.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
Rice Barton Corporation
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Valley Iron Works Co.

DRUM WINDERS
Manchester Machine Co.
Rice Barton Corporation

DRYER DRAINAGE
Stickle Steam Specialties Co.

DRYER ROLL PYROMETER
Thwing-Albert Instrument Co.

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
John Waldron Corp.

DUSTING BRUSHES
M. W. Jenkins Sons, Inc.

DYESTUFFS
American Cyanamid Company
Calco Chemical Div.
Bunge Pulp & Paper Co.
Ciba Company

E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
National Aniline Division, Allied Chemical & Dye Corp.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

EMBOSSING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
John Waldron Corp.

EMBOSSING ROLLS
The Appleton Machine Co.
Gibbs-Brower Company, Inc.
Holyoke Machine Co.
Northern Engraving & Mch. Co.
B. F. Perkins & Son, Inc.
John Waldron Corp.
Wheeler Roll Co.

EMPLOYMENT SERVICE
Bixby, R. W., Inc.
Raymond, Chas. P., Service, Inc.

EMULSIFIERS
General Dyestuff Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp.

ENZYMES
Rohm & Haas Co.
Vanderbilt Co., R. T.

EVAPORATORS
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

EXPANDERS
Mount Hope Machinery Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Jeffrey Mfg. Co.
Merrick Scale Mfg. Co.
The Permutit Company
Stephens-Adamson Mfg. Co.

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Morey Paper Mill Supply Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.
Williams-Gray Co.

FELT CLEANERS
Calgon, Inc.
General Dyestuff Corp.
Nopco Chemical Co.

FELT CONDITIONERS
Bird Machine Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works

FELT GUIDES
Black Clawson Company
Frank W. Egan & Co.
Gilbert & Nash Co.
Moore & White Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FIBRE BOARD MACHINES
The Noble & Wood Machine Co.

FILLERS
American Cyanamid Company, Industrial Chemicals Division
J. M. Huber Corp.
A. M. Meincke & Son, Inc.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

FILTERS
Bird Machine Company
Holyoke Machine Co.
Hungerford & Terry, Inc.
Improved Paper Machinery Corp.
Johnson Corp.
Moore & White Co.
J. O. Ross Engrg. Corp.
The Sandy Hill Iron & Brass Works
Walworth Company

FITTINGS
The Bagley & Sewall Company
Crane Company
Shartle Bros. Mch. Co.
Walworth Company

FLEXIBLE COUPLINGS
Egan, Frank W., & Co.
Jeffrey Mfg. Co.
Lovejoy Flexible Coupling Co.
John Waldron Corp.

FLOORING, GRATING AND TREADS
The Goodyear Tire & Rubber Company
Norton Co.

FLOW BOXES, STAINLESS-CLAD
Lukens Steel Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works

FORK LIFT TRUCKS
Elwell Parker Elec. Co.
Towmotor Corp.

FORMATION TESTERS
Thwing-Albert Instrument Co.
Williams Apparatus Co., Inc.

FOURDRINIERS
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
The Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FREENESS TESTERS
Testing Machines, Inc.
Williams Apparatus Co.

GASKETS
The Goodyear Tire & Rubber Company

GEARS
The Bagley & Sewall Company
Black Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Stroh Process Steel Co.
Valley Iron Works Co.
Westinghouse Electric Corp.
Western Gear Works

GRAPPLES
Blaw-Knox Company

GRAVITY FILTERS
Holyoke Machine Co.

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell United Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company
Simonds Abrasive Co.

GUIDES
The Bagley & Sewall Company
Black-Clawson Co.
Egan, Frank W., & Co.
Gilbert & Nash Co.
The Moore & White Co.
Mount Hope Machinery Co.
Rice Barton Corperation
John Waldron Corp.

GUMMING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
The Sandy Hill Iron & Brass Works
Waldron, John, Corp.

GUMS
Hercules Powder Co., Inc.
National Starch Products, Inc.
Stein-Hall Co., Inc.

HEAT EXCHANGERS AND RECOVERY SYSTEMS
Fibre Making Processes, Inc.
Westinghouse Electric Corp.

HEATING, VENTILATING & AIR CONDITIONING
The Appleton Machine Co.
E. D. Jones & Sons Co.
General Electric Co.
D. J. Murray Mfg. Co.
Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Valley Iron Works Co.
Ross, J. O., Engrg. Corp.

HOISTS
Reading Crane & Hoist Corp.

HOSE (Air, Water, Suction, etc.)
The Goodyear Tire & Rubber Company

HUMECTANTS
Aktivin Division, Heyden Chemical Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

IMPREGNANTS
American Cyanamid Company, Industrial Chemicals Division
B. F. Goodrich Chemical Co.

INDENTING MACHINES
Dilts Machine Works

INDUSTRIAL TRACTORS
Towmotor Corp.

INKOMETER
Thwing-Albert Instrument Co.

INSTRUMENTS, TESTING AND MEASURING
Black-Clawson Co.
Brown Instrument Co.
Bunge Pulp & Paper Co.
Cambridge Instrument Co.
General Electric Company
W. & L. E. Gurley
B. F. Perkins & Son
Taylor Instrument Cos.
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Williams Apparatus Co.

JOINTS
The Bagley & Sewall Company
Beloit Iron Works
Johnson Corp.
Lovejoy Flexible Coupling Co.
Rice Barton Corporation
Shartle Bros. Mch. Co.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Bros. Mch. Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
The Moore & White Co.
The Noble & Wood Machine Co.
Simonds Saw & Steel Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOTTERS
Black-Clawson Co.
Fibre Making Processes, Inc.
Improved Paper Machinery Corp.

LABORATORY CORRUGATOR
The Noble & Wood Machine Co.
Thwing-Albert Instrument Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
Bauer Brothers Co.
Bird Machine Company
Dilts Machine Works
W. & L. E. Gurley
Egan, Frank W., & Co.
E. D. Jones & Sons Co.
Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works Co.
John Waldron Corp.
Williams Apparatus Co., Inc.

LAMINATING MACHINES
The Bagley & Sewall Company
Dilts Machine Works
Egan, Frank W., & Co.
Rice Barton Corporation
John Waldron Corp.

LAY BOYS
Dilts Machine Works
Gibbs-Brower Company, Inc.
Hamblet Machine Co.
Moore & White Co.

LINTER COTTON
Hercules Powder Co., Inc.
Railway Supply & Mfg. Co.

LINTER PULP
Hercules Powder Co., Inc.

LUBRICANTS
Sinclair Refining Co.
Socony-Vacuum Oil Co.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

MAGAZINE REELS
Dilts Machine Works (Kohler Systems)

MATERIALS HANDLING
Dilts Machine Works
Jeffrey Mfg. Co.
Shartle Bros. Mch. Co.
The Wellman Engrg. Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Lobdell Co.
Testing Machines, Inc.

MICRO-CRYSTALLINE WAXES
Bareco Oil Co.
Bunge Pulp & Paper Co.
Sun Oil Company

MOISTURE CONTENT CONTROL
Cambridge Instrument Co.
Williams Apparatus Co., Inc.

MOTORS AND GENERATORS
Fairbanks, Morse & Co.
General Electric Company
Reliance Electric & Engrg. Co.

NEWSPRINT
Bunge Pulp & Paper Co.

NICKEL AND NICKEL ALLOYS
The International Nickel Co.

NOZZLES
Spray Engrg. Co.

PACKING BOXES
Johnson Corporation
The Moore & White Co.
Shartle Brothers Machine Co.

PAPER MACHINE DRIVES
The Bagley & Sewall Company
Black-Clawson Co.
Manchester Machine Co.
Rice Barton Corporation

PAPER MACHINES
The Bagley & Sewall Company
Beloit Iron Works
Bagley & Sewall Co.
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Lukenweld
Moore & White Co.
Pusey & Jones Corp.
Rice Barton Corporation
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINES—LABORATORY
The Noble & Wood Machine Co.

PAPER MACHINE SLICES
Black Clawson Company
E. D. Jones & Sons Co.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Jagenberg-Werke Akt. Ges.
Langston Co., Samuel M.

PARAFFINE WAXES
Sun Oil Company

PARAFFIN WAX EMULSIONS
Hercules Powder Co., Inc.
Nopco Chemical Co.

PASTING MACHINES
Beloit Iron Works
Black Clawson Company
Dilts Machine Wks.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.

Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

PEBBLE MILLS
F. L. Smidth & Co.

pH METERS
Cambridge Instrument Co.
Thwing-Albert Instrument Co.

PIPE
Armco Drainage & Metal Products, Inc.
Babcock & Wilcox Co.
Crane Company
Grinnell Company
Michigan Steel Casting Co.
National Tube Co.
Walworth Company

PIPE FITTINGS
Armco Drainage & Metal Products, Inc.
Crane Company
Grinnell Company
Michigan Steel Casting Co.
Walworth Co.

PITCH CONTROL
American Cyanamid Company, Industrial Chemicals Division
General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.

PLASTICIZERS
American Cyanamid Company, Industrial Chemicals Division
Aktivin Division, Heyden Chemical Corp.
B. F. Goodrich Chemical Co.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Rohm & Haas Co.

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F.

PLATES
Armco Steel Corp.
Babcock & Wilcox Co.
J. O. Ross Engrg. Corp.
Lukenweld Division
Lukens Steel Company
Timken Roller Bearing Co.

PLUGS
The Appleton Machine Co.
Black Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

POPE TYPE REELS
Black-Clawson Co.
Egan, Frank W., & Co.
Manchester Machine Co.
Rice Barton Corporation

PRECISION SAMPLE CUTTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

PRESERVATIVES
E. I. du Pont de Nemours & Co.
General Dyestuff Corp.

PRESS ROLLS
Beloit Iron Works
Black-Clawson Co.
Rice Barton Corporation

PRESSURE FILTERS
Holyoke Machine Co.

PRESSURE VESSELS
Biggs Boiler Works Co.
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.

PRESSES
Black Clawson Company
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson-Sharp Mch. Co.
The Moore & White Co.
Potdevin Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.
Williams Apparatus Co.

PULLEYS
Black-Clawson Co.
Lovejoy Flexible Coupling Co.
Rice Barton Corporation

PULP CLASSIFIER
The Bauer Bros. Co.
Thwing-Albert Instrument Co.

PULP CLEANERS
Nichols Engrg. & Research Corp.

PULP STOCK VALVES
Crane Company
Record Fdy. & Mach. Co.
Shartle Brothers Machine Co.

PULPERS
Apmew, Inc.
Bauer Brothers Co.
Dilts Machine Works
E. D. Jones & Sons Co.
Morden Machines Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PULPS
Brown Company
Bulkley, Dunton Pulp Co., Inc.
Bunge Pulp & Paper Co.
Gottesman & Co., Inc.
Lyddon & Co. (America), Inc.
Nordicus, Inc.
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Restigouche Co., Ltd.

PULPSTONES
Norton Company

PULP TESTERS
Williams Apparatus Co., Inc.

PULVERIZING MILLS
Combustion Engineering-Superheater, Inc.
Jeffrey Mfg. Co.
F. L. Smith & Co.

PUMPS
Apmew, Inc.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Buffalo Pumps, Inc.
Byron Jackson Co.
DeLaval Steam Turbine Co.
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Gibbs-Brower Company, Inc.
Johnson Corp.
Moore & White Co.
The Noble & Wood Machine Co.
Nash Engineering Co.
Roots Connersville Blower Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

RADIANT BURNERS
Red-Ray Mfg. Co., Inc.

RAG COOKING PROCESSES
The Kinsley Chemical Company
General Dyestuff Corp.
Rohm & Haas Co.

RAG CUTTERS
Gibbs-Brower Company, Inc.
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

RECOVERY SYSTEMS
Babcock & Wilcox Co.
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones Corp.
Ross Engineering Corp., J. O.
Valley Iron Works Co.

REELS
The Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works (Kohler Systems)
Egan, Frank W., & Co.
Downingtown Mfg. Co.
Hudson-Sharp Mch. Co.
Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.
Waldron, John, Corp.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
The Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout Waldron & Co., Inc.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Apmew, Inc.
Bird Machine Company
General Electric Co.
Improved Paper Machinery Corp.
Johnson Corp.
Shartle Brothers Machine Co.
Taylor Instrument Companies

RESINS
American Cyanamid Company, Plastics & Resins Division
The Dow Chemical Company
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Plaskon Division, Libbey-Owens-Ford Glass Co.
Reichhold Chemicals, Inc.
Rohm & Haas Co., Resinous Products Div.

ROLLS
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Holyoke Machine Co.
Lobdell United Co.
Edward J. McBride Co., Inc.
The Moore & White Co.
D. J. Murray Mfg. Co.
The Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
U. S. Rubber Co.
Valley Iron Works Co.
Waldron Corp., John
Wheeler Roll Co.

ROLL COVERS
The Goodyear Tire & Rubber Company

ROLL HANDLING EQUIPMENT
Dilts Machine Works (Kohler Systems)

ROLL STANDS
Cameron Machine Co.
Dilts Machine Works (Kohler Systems)
Frank W. Egan & Co.
Johnstone Engrg. & Mch. Co.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
John Waldron Corp.
H. G. Weber & Co., Inc.

ROPE CARRIERS
Black Clawson Co.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works

ROTARY KILNS
F. L. Smidth & Co.

ROTARY STEAM JOINTS
Johnson Corp.
The Moore & White Co.
Rice Barton Corporation
Shartle Bros. Mch. Co.

RUBBER PRODUCTS
The Goodyear Tire & Rubber Company

SATURANTS
B. F. Goodrich Chemical Co.

SATURATING MACHINES
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

SAVEALLS
Bird Machine Company
Chicago Bridge & Iron Co.
Improved Paper Machinery Corp.

SAWS
Simonds Saw & Steel Co.

SCALES
Fairbanks, Morse & Co.
Merrick Scale Mfg. Co.
Testing Machines, Inc.

SCREEN PLATES
Bird Machine Company
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.
Union Screen Plate Co.

SCREENS
Appleton Wire Works
Appleton Machine Company
The Bagley & Sewall Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SHEET MACHINES
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Valley Iron Works Co.
Williams Apparatus Co., Inc.

SHEET MACHINES—LABORATORY
The Noble & Wood Machine Co.

SHEETERS
Jagenberg-Werke Akt. Ges.

SHOWER PIPES
Bird Machine Company
Black-Clawson Co.
Downingtown Mfg. Co.
Moore & White Co.
Sandusky Fdy. & Mch. Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.
Gibbs-Brower Company, Inc.
Jeffrey Mfg. Co.

SIZE PRESSES
Black-Clawson Co.
Manchester Machine Co.
Rice Barton Corporation

SIZING
American Bitumuls & Asphalt Co.
American Cyanamid Company, Industrial Chemicals Division
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
Glidden Company
Hercules Powder Co.
The Hubinger Co.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

SIZING TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Williams Apparatus Co., Inc.

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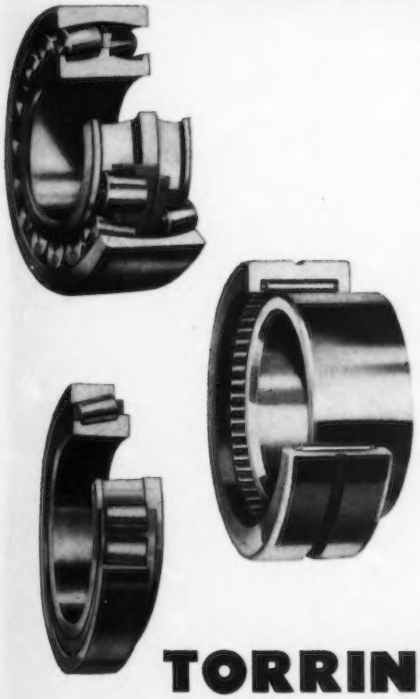

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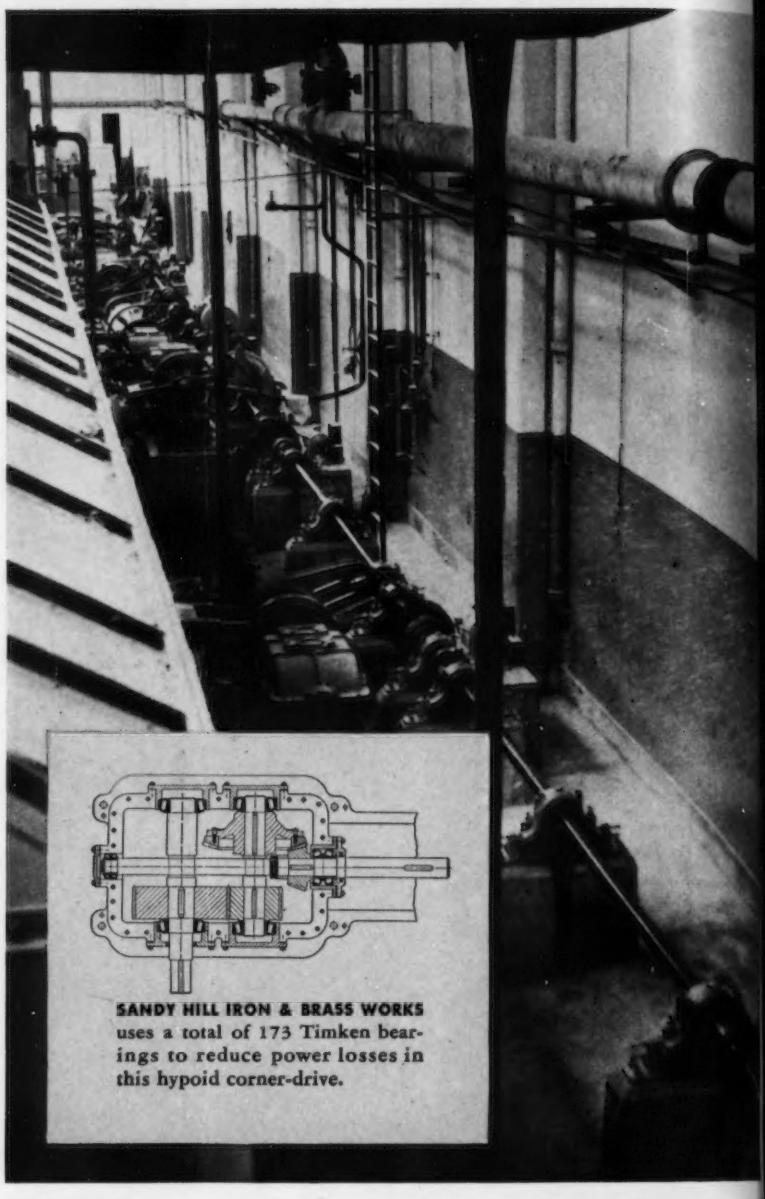

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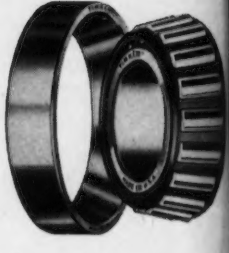

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